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A HANDBOOK
OF
DISEASES OF THE NOSE
AND
NASO-PHARYNX

BY

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LONDON

H. K. LEWIS, 136 GOWER STREET, W.C.

1890

LONDON :

PRINTED BY H. K. LEWIS,

136, GOWER STREET, W.C.

~~TR 415~~
~~890b~~

RF 342

890 B

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P R E F A C E .

My aim, in the present work, has been to give, within a moderate compass, such a description of the diagnosis and treatment of diseases of the nose and naso-pharynx as might be useful to the senior student and practitioner. I have avoided, as far as possible, controversial points and theoretical discussions. Some rare affections, not met with in this country, such as, Rhinoscleroma, and Parasites in the Nose, I have omitted altogether, and I have dealt rather briefly with some of the less common diseases, especially those of a surgical nature.

WIMPOLE STREET,

May, 1890.



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DISEASES OF THE NOSE

AND

NASO-PHARYNX.



I.

ANATOMY.

THE parts to be described may be conveniently considered in the following divisions, viz., the cartilaginous portion, the nasal fossæ, and the naso-pharynx. There are also certain spaces known as the accessory sinuses, which communicate with the nasal fossæ.

1. THE CARTILAGINOUS PORTION.

The cartilaginous nose consists of a framework of cartilages and dense fibrous tissue (Fig. 1), covered with integument. It forms, in conjunction with the nasal bones and the nasal process of the superior maxillary bone, the prominent feature of the face. The cartilages are five in number, viz., an upper and lower lateral cartilage on each side, and the cartilage of the septum. Certain small muscles are attached to, and move the cartilages.

The **upper lateral cartilage** has a triangular shape. At its upper margin it is united with the lower free border of the nasal bone. In front it is firmly united with the septal cartilage, of which it may be described as a lateral expan-

sion. To the lower border is attached a layer of fibrous tissue which connects it at the fore part with the lower lateral cartilage.

The **lower lateral cartilage** (cartilage of the ala), thinner than the preceding, is bent upon itself in front, at a somewhat acute angle, so as to form a portion of the inner and the outer wall of each nostril. The portion in the inner wall meets its fellow of the opposite side in front, with

which it is loosely connected. Behind it is separated from that of the opposite side by the cartilage of the septum, while its free extremity projects slightly into the nostril, forming a prominence just within the orifice. The portion in the outer wall corresponds to the anterior half of that wall, and a tough fibrous membrane connects it behind with the ascending process of the superior maxilla. In this fibrous membrane are two or three cartilaginous nodules, the so-called **sesamoid cartilages**. The angular prominences formed by the two lower lateral cartilages in front, with a median groove between, go to make, with the tegumental

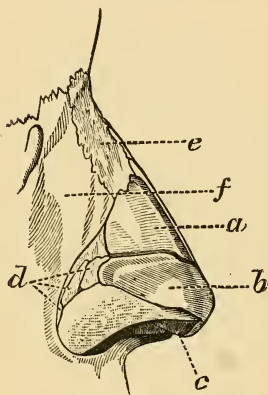


FIG. 1.—Lateral view of the Cartilages of the Nose. (From Quain after Arnold.)

a, Upper lateral cartilage; *b*, lower lateral cartilage; *c*, inner part of the same; *d*, sesamoid cartilages; *e*, nasal bone; *f*, nasal process of the superior maxillary bone.

covering, the tip or **lobule** of the nose.

The **cartilage of the septum** is somewhat triangular in shape (Fig. 3). It supports the lateral cartilages, and divides the cavity which they enclose into two parts, and it completes at the fore part the partition between the two nasal fossæ. Its posterior margin is attached to the edge of

the descending plate of the ethmoid. The lower margin is received into a groove in the edge of the vomer, and into the median ridge or crest formed by the superior maxillæ. In front it is attached to the nasal bones, the anterior edges of the upper lateral cartilages, and the inner portions of the lower lateral cartilages.

The orifices of the nose, **anterior nares**, are directed downwards, and are irregularly ovoid in shape, more nearly circular in children than in adults. The partition between the two anterior nares, termed the **columna nasi**, is formed by the inner portions of the lower lateral cartilages which project below the level of the septal cartilage, together with a covering of integuments. The cartilaginous nose contains two cavities termed **vestibules**, which are narrow above and behind, where they become continuous with the nasal fossæ, but widen out below, at the anterior nares. The outer wall of the vestibule corresponds with the outer portion of the lower lateral cartilage, and the fibrous tissue containing the sesamoid cartilages. This part is freely movable, and is known as the **ala** of the nose. On the outer surface of the nose a groove runs backwards and slightly upwards from the lobule, and curving downwards behind is prolonged on to the face, gradually disappearing towards the angle of the mouth (**naso-labial groove**). This groove marks the upper limit of the ala nasi, and the wall of the vestibule is here easily depressed. It corresponds internally with a projection which contracts the cavity of the vestibule above, and which, when approximated to the septum by muscular

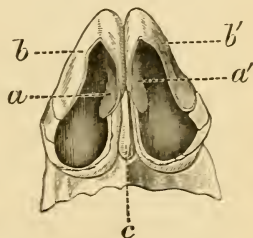


FIG. 2.—View of the Cartilages of the Nose from below.
(From Quain after Arnold.)

a a', Inner parts of the lower lateral cartilages; *b b'*, outer parts of the same; *c*, lower edge of the cartilage of the septum.

action or otherwise, tends to shut off the vestibule from the cavity of the nasal fossa.

The movements of the cartilaginous part are effected by certain small muscles, six in number. Of these the most important are the **compressor nasi** and **depressor alæ nasi**, which narrow the vestibule; the **dilatator naris**, which enlarges the lower aperture by everting the ala, and the **levator labii superioris alæque nasi**, which draws up the upper lip and the ala.

The skin on the outer surface of the nose is studded with

numerous openings of sebaceous follicles, especially marked in the groove immediately above the ala. The skin is prolonged into the nose so as to line the vestibules, and becomes continuous with the mucous membrane at the level of the lower border of the upper lateral cartilage. Within the margin of the orifices of the nostrils are numerous short, stiff hairs, **vibrissæ**.

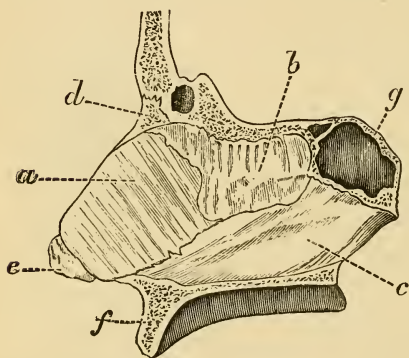


FIG. 3.—Cartilaginous and Bony Septum seen from the left side. (From Quain after Arnold.)

a, Cartilage of the septum; *b*, the perpendicular plate of the ethmoid bone; *c*, the vomer; *d*, the right nasal bone; *e*, inner part of the right lower lateral cartilage; *f*, the superior maxillary bone; *g*, the sphenoidal sinus.

The **arteries** of this region arise from branches of the facial. The **veins** end in the facial vein. The sensory **nerves** are derived from the nasal and infra-orbital branches of the fifth, and the motor nerves arise from the seventh.

2. THE NASAL FOSSÆ.

The nasal fossæ are two irregularly-shaped cavities bounded by bony walls, and separated from each other in the middle line by a partition, partly bony, partly cartilaginous. They are lined throughout by mucous membrane, which, owing to its thickness in certain places, and to its closing or narrowing many openings in the bony framework, alters considerably the configuration from that which is found in the dried skull. Each cavity is flattened from side to side, and a roof, a floor, an inner and an outer wall have to be described.

The **roof** is irregular. The middle is the narrowest part, and is nearly horizontal. It is formed by the cribriform plate of the ethmoid. This is the weakest part of the base of the skull. From this part the roof slopes downwards and forwards, in front, beneath the nasal spine of the frontal and the nasal bones, and still more sharply downwards behind, beneath the body of the sphenoid. The **sphenoidal sinus** opens into the nasal fossa by a circular opening in the posterior part of the roof, nearer the outer than the inner wall, and just behind the superior turbinate bone.

The **floor** of the nasal fossa is formed by the palate plates of the superior maxillary and palate bones, and is fairly smooth. It is very slightly concave from before back, and more decidedly so from side to side.

The **inner wall** is formed by the septum nasi (Fig. 3), which is composed of the triangular cartilage in front, and behind, and in greater part by the descending plate of the ethmoid and the vomer, and below by the crests of the superior maxillary and palate bones. The septum often bulges to one side or the other, especially in its cartilaginous part, and more often to the left side.

The **outer wall** (Fig. 4), is the most extensive and com-

plicated surface, and several bones enter into its formation. In front are the nasal process of the superior maxilla, and the lachrymal bone, in the middle the ethmoid, the inner surface of the superior maxilla, and the inferior turbinate bones, and behind is the vertical plate of the palate bone. It may be regarded as an irregularly flattened surface, with three

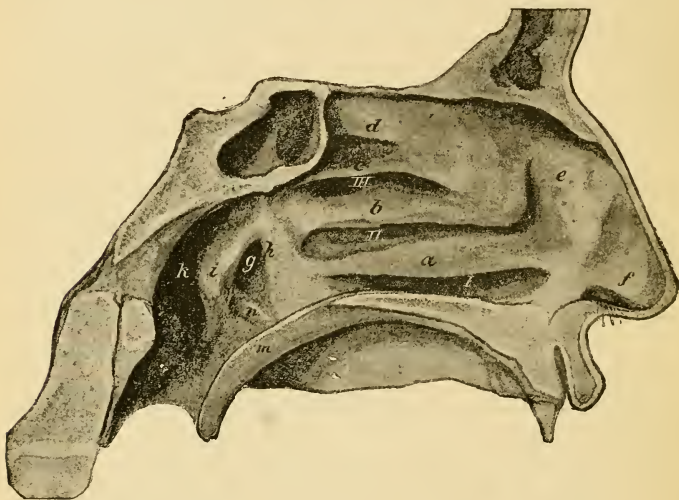


FIG. 4.—Outer Wall of the Left Nasal Fossa.

I., Inferior meatus ; II., Middle meatus ; III., Superior meatus. *a*, The inferior turbinate body ; *b*, the middle turbinate body ; *c*, the superior turbinate body ; *d*, a fourth turbinate body ; *e*, the agger nasi, just below which is the atrium ; *f*, the vestibule ; *g*, Eustachian orifice ; *h*, anterior lip of the Eustachian orifice ; *i*, posterior lip of the same ; *k*, Rosenmüller's fossa ; *m*, the soft palate ; *n*, the levator cushion.

marked prominences upon it, each having an antero-posterior direction, and situated about equal distances apart. These prominences are the **turbinate bones**, so called on account of their rolled-up form. They are also termed **spongy bones** on account of their porous texture. Each consists of a thin plate of bone, which projects into the cavity of the

fossa, curving downwards so as to enclose a space. The two upper turbinate bones are portions of the ethmoid, the lower is an independent bone, articulating with the superior maxilla. The **superior turbinate bone** is the shortest of the three. It is situated near the roof, far back, and blends with the middle turbinate at its fore part. Just behind its posterior end, in the roof of the fossa, is the opening of the sphenoidal sinus. There is a smaller, fourth turbinate bone, above the superior turbinate, in about one in every three specimens. The **middle turbinate bone** is larger than the preceding. It commences in the same line behind, but extends farther forward. It has a free anterior margin, which has a vertical depth of about half an inch. Its lower margin is thick, so as to have an inner and an outer edge. Running downwards and forwards on the outer wall from the anterior end of the middle turbinate, parallel to the nasal bone, is an elevation, usually only slightly marked, termed the **agger nasi**. Below this, is a slight depression, termed the **atrium**, which lies between the upper end of the vestibule and the anterior end of the middle turbinate bone. The **inferior turbinate bone** is larger than the middle, commencing in the same line behind, and extending farther forwards. It gradually slopes off into the outer wall anteriorly.

Below each turbinate bone is the corresponding **meatus**. The **superior meatus** is very short and narrow, and lies between the under surface of the superior, and the upper surface of the middle turbinate bone. Into it open the posterior ethmoidal cells, by an orifice of variable size, and sometimes the middle ethmoidal cells open into this meatus.

The **middle meatus** is the space between the inferior curved surface of the middle turbinate, and the inferior turbinate bone, and extends along the posterior two-thirds of the outer wall of the fossa. On the outer wall, near the fore part, concealed by the overhanging middle turbinate, is

a semilunar slit, the **hiatus semilunaris**, the convexity of which looks downwards and forwards. This slit leads into a deep groove in the outer wall, the **infundibulum**, which, like the hiatus, runs in a curved direction downwards and backwards. At the anterior and upper extremity of the infundibulum is the small circular opening of the canal lead-

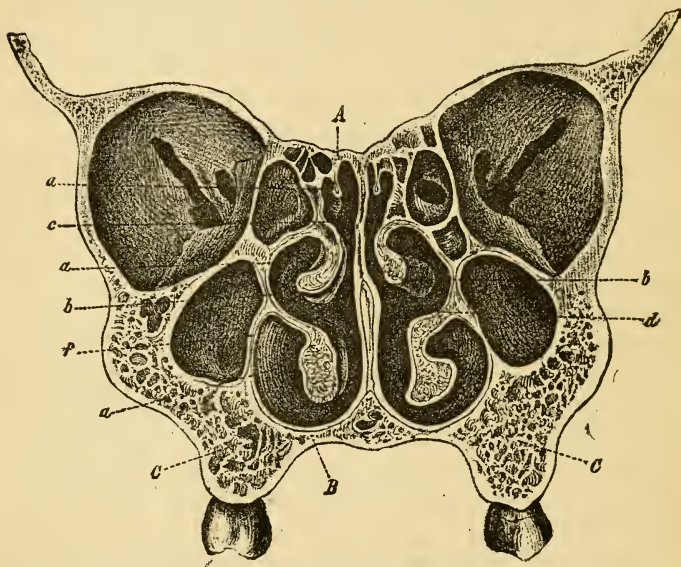


FIG. 5.—Vertical Transverse Section through the Posterior Part of the Nasal Fossæ
(After Zuckerkandl.)

A, The roof of the nasal fossa ; *B*, the floor ; *C*, the alveolar process ; *a*, *a*, *a*, the superior, middle, and inferior meatuses ; *b*, the middle turbinate bones ; *c*, the olfactory region ; *d*, the respiratory region.

ing up to the frontal sinus. Near the lower and posterior part of the infundibulum is an opening generally somewhat slit-like, which leads directly into the antrum of Highmore. A little behind the upper extremity of the hiatus semilunaris, is an opening leading into the anterior ethmoidal cells. These cells also generally have another opening, in the infun-

dibulum near its upper part. Below the hiatus semilunaris, just above the attachment of the inferior turbinate body, there is sometimes a second small opening into the antrum. In the skeleton there is a large opening at this part, but the mucous membrane usually completely covers it.

The **inferior meatus**, longer than the preceding, is the space between the inferior turbinate bone and the floor of the fossa. At its fore part, concealed by the turbinate body, is the orifice of the **nasal duct**. The space between the septum and the inferior turbinate body is sometimes spoken of as part of the inferior meatus.

The relations of the various parts of the nasal fossæ will be made clearer by Fig. 5, which represents a vertical transverse section through the fossæ.

The mucous membrane of the nasal fossa, known as the pituitary, or Schneiderian membrane, is highly vascular, and is inseparably united with the periosteum and perichondrium. It is continuous with the conjunctiva through the nasal duct, and with the mucous membrane lining the various sinuses through the orifices above mentioned. Owing to its thickness, the nasal cavities are much narrower in the living subject than in the dried skull, and the turbinate bones are more prominent. Certain orifices and clefts exist in the dried skull which are closed by the mucous membrane, and therefore have not been described. The membrane is particularly thick over the turbinate bones, especially over the inferior turbinate, and forms prolongations from their free borders and extremities. The term **turbinate body** is generally used to designate the bone with its soft covering. On the septum nasi the mucous membrane is also very thick.

Two regions must be distinguished with respect to the character of the nasal mucous membrane, viz., the olfactory and respiratory regions. The **olfactory region** includes the superior turbinate body, the upper and inner surface of the middle turbinate body, and the opposed upper part of

the septum. In this region the olfactory nerve is distributed, and the organ of smell is seated. The mucous membrane here has a somewhat brownish tint, and is covered with non-ciliated columnar epithelium. It contains numerous serous glands of a simple tubular character, with few alveoli, known as Bowman's glands. The **respiratory region** includes the inferior turbinate body and all the lower parts of the fossa. This region has more practical importance in relation to nasal troubles. The mucous membrane is thicker and more vascular than in the olfactory region, and is covered with stratified columnar ciliated epithelium, like that of the respiratory passages, generally. It contains numerous racemose glands, yielding chiefly a watery serous secretion. Numerous lymph corpuscles are infiltrated in the mucosa, so as to constitute, in places, a diffuse adenoid tissue.

A rich plexus of veins underlies the mucous membrane of the respiratory region. This venous plexus is particularly rich on the inferior turbinate bodies, where the structural arrangement resembles somewhat the erectile tissue in the genital organs, fibrous trabeculæ supporting in their meshes a network of venous channels lined by endothelium. This cavernous plexus, or **erectile tissue**, as it is termed, is of considerable importance. It is most markedly developed on the inferior turbinate body, and is present to some extent on the fore edge of the middle turbinate, and the posterior extremities of the middle and superior turbinates (*Zuckerkanndl*).

The mucous membrane of the septum presents a thickening, due in great part to the abundance of racemose glands, opposite the anterior end of the middle turbinate body, the **tubercle** of the septum. This thickening narrows the entrance to the olfactory slit from the front.

The **arteries** of the nasal cavities are derived from the internal maxillary artery, through its sphenopalatine and

descending palatine branches, and from the ethmoidal branches of the ophthalmic artery. The **veins** empty themselves partly into the pterygoid plexus, but principally into the ophthalmic and facial veins. A few veins pierce the cribriform plate of the ethmoid to join veins in the interior of the skull. The **lymphatics** join the retro-pharyngeal glands, the deep cervical glands beneath the upper part of the sterno-mastoid, and glands in the substance of the parotid. The **nerves** are of two kinds, viz., the olfactory nerve, and the nerves of common sensation. The olfactory nerve is distributed over the upper and middle turbinate bodies, and the upper third of the septum. The nerves of common sensation for the nose are derived from branches of the fifth nerve. The nasal branch of the ophthalmic is distributed on the anterior part of the septum, and on the anterior and upper parts of the outer wall; some filaments, from the anterior dental branch of the superior maxillary nerve, enter the lower meatus, and are distributed on the lower spongy bone, and branches from Meckel's ganglion are distributed to all the remaining parts of the lining of the nasal fossa.

3. THE NASO-PHARYNX. (Post-nasal space.)

The naso-pharynx is that portion of the pharynx which lies behind the nasal cavities. It has an irregularly cubical shape, and thus a roof, floor, and four walls have to be described.

The **roof** lies immediately below the base of the skull (body of the sphenoid), behind the posterior edge of the septum nasi (vomer). It passes insensibly, without any intervening angle, into the posterior wall, and is the seat of a mass of adenoid tissue to be presently described.

The **anterior wall** is limited by the posterior openings of the nasal fossæ, the **posterior nares**, or **choanæ**. These openings are separated by the posterior margin of the

septum nasi. This margin is thin in the middle, but widens out above and below. It is slightly concave from above downwards. Below the openings of the posterior nares are the edge of the palate bones and the attachments of the soft palate. The **posterior wall** slopes down without any sharp angle between it and the roof. It is formed by the arch of the atlas and the occipito-altoid ligament in the centre, and the recti capitis antici muscles at each side.

The **lateral walls** are in relation with the petrous portions of the temporal bones and the internal pterygoid plates of the sphenoid. At the upper part of each lateral wall is situated the somewhat trumpet-shaped prominence formed by the cartilaginous portion of the Eustachian tube, in which is contained a more or less funnel-shaped depression leading into the tube. The upper boundary of this depression is a prominent curved ridge, the **Eustachian cushion**, formed by the Eustachian cartilage, which, being curved so as to present a concavity downwards, has an anterior and a posterior lip (Fig. 4). The posterior lip is the more prominent. From the anterior lip a fold of mucous membrane, **salpingo-palatine**, passes downwards in front of the Eustachian orifice towards the floor of the posterior naris. From the posterior lip a more prominent fold, **salpingo-pharyngeal**, passes downwards behind the orifice, and gradually blends with the lateral wall of the pharynx, behind the posterior pillar of the fauces. At the lower margin of the depression of the Eustachian orifice is a slight prominence formed by the levator palati muscle, and known as the **levator cushion**. The orifice of the tube is somewhat oval, measuring most from above downwards, and is on a level with the inferior meatus of the nose. The Eustachian tube itself has a slit-like lumen, the anterior and posterior walls being in apposition, except during certain muscular acts. Behind the prominence of the Eustachian tube, between it

and the posterior wall, is a marked depression, known as **Rosenmüller's fossa**.

The mucous membrane lining the naso-pharynx is covered in great part with columnar ciliated epithelium. Numerous racemose mucous glands open on its surface. The mucosa is infiltrated with

diffuse adenoid tissue, and many lymph follicles. This is more especially the case in the roof and upper parts of the posterior wall. The lymphoid tissue in the roof forms a more or less prominent irregular mass, with crypts leading from the surface into the mass, and constitutes the so-called **pharyngeal tonsil**, or **Luschka's tonsil** (Fig. 6). The

pharyngeal tonsil

(Fig. 6) varies in size, and is continued from the roof, for a variable distance, on to the posterior wall, and extends more or less into Rosenmüller's fossa on each side. It is divided into numerous folds and elevations by grooves and depressions of various size. Almost always a distinct orifice exists in the middle line near the lower part of Luschka's tonsil, which leads into a recess of the mucous membrane situated beneath the tonsil. This recess is known as the **pharyngeal bursa**, and is of some importance in relation to naso-pharyngeal troubles. It extends upwards behind the

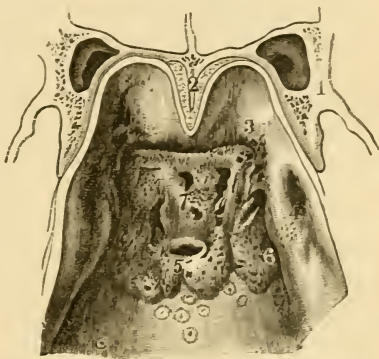


FIG. 6.—Naso-pharynx and Pharyngeal Tonsil.
(After Luschka.)

1, Pterygoid process; 2, vomer; 3, posterior extremity of the roof of the nasal fossa; 4, orifice of Eustachian tube; 5, orifice of the pharyngeal bursa; 6, Rosenmüller's fossa; 7, adenoid tissue, showing depressions on surface.

pharyngeal tonsil towards the occipital bone, sometimes in the form of a canal, sometimes of a more or less roomy space, with a maximum length of about fifteen millimètres, and a maximum width of six millimètres (*Luschka*). Its interior is lined partly by columnar ciliated, partly by stratified pavement epithelium. There are many follicles in the mucous lining, and numerous mucous glands open on to the surface of the lining near the orifice of the bursa. The orifice of the bursa sometimes presents the form of a slit, and occasionally, instead of a single orifice in the median line, two orifices are seen, one at each side of the middle line. Other variations also occur, and sometimes neither bursa nor orifice is present (see page 84).

The **floor** of the naso-pharynx can only be said to exist when by contraction of the muscles in this region the nasopharynx is cut off from the space below. An important agent in effecting this closure is the soft palate, about which a few words must be said.

The **soft palate**, or **velum palati**, is a movable curtain, which hangs obliquely downwards and backwards from the posterior margin of the hard palate. It consists of a double fold of mucous membrane with muscular fibres between. From the centre of the lower margin hangs the conical projection of the **uvula**, containing the fibres of the 'azygos uvulæ muscle. At each side of the uvula, the lower margin of the velum divides into two folds. One passes downwards in front of the tonsil to the base of the tongue. This contains the fibres of the palato-glossus muscle, and forms the **anterior pillar** of the fauces. The other fold passes down behind the tonsil to blend with the lateral wall of the pharynx. This contains the palato-pharyngeus muscle, and constitutes the **posterior pillar** of the fauces. Two muscles are connected with the soft palate above. The levator palati muscle passes down from the tip of the petrous bone and the Eustachian tube to the upper surface

of the palate forming an elevation just behind the posterior naris, the levator cushion. The tensor palati muscle, arising from the sphenoid bone, and the anterior lip of the cartilage of the Eustachian tube, hooks round the hamular process and joins the soft palate. By means of the soft palate the floor of the naso-pharynx is closed in phonation and deglutition. The levator and tensor muscles raise the palate and make it tense; the salpingo-pharyngeal folds on each side swell up and approach each other, and the contracted azygos uvulæ muscle and a projection forwards of the posterior pharyngeal wall, due to contraction of the superior constrictor, complete the closure.

The **arteries** of the naso-pharynx are derived from the external carotid, through branches of the ascending pharyngeal, the internal maxillary, and the facial. The **veins** terminate in the internal jugular. The **lymphatics** enter glands in the substance of the parotid, the retro-pharyngeal glands, and the deep cervical glands near the bifurcation of the common carotid. The **sensory nerves** are derived from the fifth, principally from the second division, with a few twigs from the third division. The **motor nerves** of the velum palati are derived from the third division of the fifth, which supplies the tensor palati through the otic ganglion, from the eleventh nerve, which supplies, through the pharyngeal branches of the vagus, the levator palati, azygos uvulæ, palato-glossus, and palato-pharyngeus muscles. The levator palati is said also to receive a motor supply from the facial through Meckel's ganglion.

4. THE ACCESSORY SINUSES.

These are air spaces situated in the neighbouring bones and communicating with the nasal fossa. They are four in number on each side, viz., the maxillary, frontal, sphenoidal, and ethmoidal sinuses. With the exception of the maxillary, these sinuses are absent in early youth.

The **Maxillary Sinus**, or **Antrum of Highmore**, is the largest of the sinuses. The cavity has a somewhat pyramidal shape, the apex being directed outwards towards the malar process and the base towards the nasal fossa. Its capacity varies much. Sometimes projecting laminæ of bone cross the cavity and subdivide it. The relation of the sinus to the alveolar process is of much practical importance. In certain cases a layer of spongy bone separates the whole extent of the alveolar process from the wall of the cavity, increasing in thickness backwards towards the wisdom teeth, and still more, forwards, towards the incisor teeth, the latter being always the farthest from the cavity. The alveoli of the first and second molars are always the nearest, and mostly form conical projections into the cavity. Sometimes the sinus extends so far into the alveolar process, that the alveoli of all the teeth as far forwards as the canines, and inclusive of these, form little projections in the floor. Occasionally over certain roots the bone may be absent, and the fangs of the teeth may be separated from the cavity only by mucous membrane.

The maxillary sinus communicates with the nose by a small opening, occasionally circular, more usually slit-like, being elongated from before backwards. This opens into the sinus near its roof, and into the middle meatus of the nose at the posterior part of the deep groove, known as the infundibulum, the margins of which, especially the lower, are here formed by projecting folds of mucous membrane, which are liable to swell and thus impede the escape of fluid from the sinus. A little below and behind this opening, a second opening of varying size exists, in about one case in every ten.

The **Frontal Sinus**, situated between the outer and inner table of the frontal bone, resembles in shape a three-sided pyramid, the apex being directed upwards and the base being formed by the orbital plate. The sinus is separated from that of the opposite side by a thin septum,

which frequently deviates to one side or the other. The cavity varies in size, and in some persons is altogether absent, and the sinuses on the two sides are usually unsymmetrical. The frontal sinus communicates with the nose by a canal which leads from the floor of the sinus, into the upper end of the infundibulum. The situation of this canal, and the fact that the mucous membrane around the orifice into the nose is closely applied to the bone, favours the escape of fluid from the sinus.

The **Sphenoidal Sinus** is situated at the posterior part of the roof of the nasal fossa in the body of the sphenoid. Its size varies much. It is separated from its fellow by a thin septum, which is often incomplete, and deviates to one side or the other. Sometimes it is subdivided into upper and lower compartments by prominent ridges of bone. It communicates with the nose by a fair-sized opening near the roof of the sinus, and behind the superior turbinate body.

The **Ethmoidal Sinuses**, or **Cells**, are disposed round the lateral circumference of the ethmoid, the spaces being completed by the surrounding bones, viz., the frontal, sphenoid, lachrymal, inferior maxillary and palate bones. These cells vary in size and number. They communicate with one another, and are divided into **anterior**, **middle**, and **posterior** ethmoidal cells. The anterior cells open into the middle meatus behind the opening of the frontal canal, and the middle and posterior cells open into the superior meatus.

The **mucous membrane**, lining the various air spaces, is continuous with that of the nose, but is thinner and less vascular. Its deeper layer is everywhere closely united to the bone, of which it forms the periosteum, and its surface is covered throughout with columnar ciliated epithelium. The mucous membrane of the maxillary sinus is thicker than that of the others, and contains a moderate number of tubular and acinous glands. The frontal and sphenoidal sinus, and the anterior ethmoidal cells, contain a few sparsely distributed glands.

II.

PHYSIOLOGY.

A PROPER appreciation of the relation of the nasal and naso-pharyngeal passages, in part or whole, to certain functions is very important, in order to comprehend how various symptoms arise when these passages are the seat of disease. The functions in relation to which these regions have to be considered are respiration, smell, taste, speech, and hearing.

1. **Respiration.**—It cannot be too strongly insisted upon that the nose, and not the mouth, is the upper part of the respiratory tract. During quiet respiration, in the normal condition, the air passes through the nose, mainly through the inferior meatus, and the space between the inferior turbinate and the septum (respiratory tract). Access to this is increased by elevation of the alæ in conditions of dyspnœa. In hurried respiration the mouth is used, and then only as a subsidiary channel. Habitual mouth-breathing is a condition of disease, arising from some obstruction of the nasal or naso-pharyngeal passages, and it can develop into a habit, which continues after the obstruction has disappeared.

The nose performs three functions in connection with respiration. It **purifies** the inspired air, it **moistens** it, and **alters its temperature**. Particles of dust are intercepted to some extent by the vibrissæ at the orifice of the nose, and are partly retained by the mucous membrane in the nasal passages. By virtue of its moisture the mucous membrane

of the nose imparts to air, inspired through it, a considerable amount of water. In fact, the air is completely saturated in its passage through the nose, and it has been computed that water to the amount of some 7,700 grains is daily abstracted from the nasal mucous membrane in this manner (*Aschenbrandt, Kayser*). This amount agrees with that which physiologists have supposed to be abstracted from the lungs in twenty-four hours. This moisture is presumably secreted by the numerous serous glands with which the mucous membrane is studded.

Besides being saturated with moisture, the air, in its passage through the nose, is brought more nearly to the temperature of the body. *Aschenbrandt* and *Kayser* have both shown by independent experiments that, with the external temperature at from 46° F. to 53° F., the temperature of the air after it has passed through the nose is raised to 86° F. When the external air is at 32° F. it is raised to 81° F., and when at 66° F. to 90° F. (*Kayser*). *Kayser* also performed a series of experiments to find how much the air was warmed and moistened in oral breathing. He found that air was heated only half a degree less in passing through the mouth than in passing through both nostrils, and further, that it is saturated with moisture in its passage through the mouth. It will, therefore, be seen that the inspired air receives the whole of its warmth and moisture before it reaches the lower air-passages.

The patency of the inferior meatus is subject to alteration by temporary erection of the inferior turbinate body, especially of its anterior end. The conditions under which this occurs are not thoroughly understood, and it is difficult to exactly draw the line between physiological and pathological swelling of that body. Direct irritants will cause it to swell, and so will inhalation of very cold or overheated air. Erection of the anterior end of the inferior turbinate body has been noticed by *Hack* and others to occur, in a

reflex manner, by the action of a strong light, and through the application of cold to the skin. These bodies have been sometimes observed to swell in women at the menstrual periods. Sudden swelling and sudden collapse of the bodies have both been observed to occur under the influence of mental impressions, fright, etc.

2. **Smell.**—As already stated, the mucous membrane on the upper turbinate body, on the upper and inner surface of the middle turbinate body, and on the opposed part of the septum, is supplied with nerves from the olfactory bulbs, and constitutes the organ of smell. Odorous emanations are conducted to this region by the air, and the air must be in motion, in order that odours may be perceived. The first moment of contact is the most acute. During quiet breathing the chief current of air is directed along the lower part of the nasal fossa, but a small amount passes into the olfactory region, and we perceive strong smells without effort. By sniffing up the air we can draw a larger quantity into the olfactory region, and increase our perception of smells. This is due to the fact that the anterior nares have a downward direction, the external orifice being about a quarter of an inch below the floor of the nose, and thus the air, sharply sniffed up, tends to pass upwards into the olfactory region.

Integrity of the olfactory nerves, and centres, is of course essential to the function of smell. Moisture of the mucous membrane is also necessary for the perception of smell. Everything interfering with the free movements of air, through the olfactory region, or with the healthy condition of its mucous membrane, will interfere with the sense of smell. It must be remembered that certain pungent substances, such as ammonia, snuff, and the like, exert a stimulating action on the fifth nerve, which is independent of true olfactory sensation. Althaus states that electrical stimulation of the olfactory membrane gives rise to a sensation of a smell of phosphorus.

3. **Taste.**—A good deal of what we call taste is really smell. The nerves of taste derived from the glosso-pharyngeal and fifth, supplying the tongue and fauces, enable us to perceive the four varieties of taste, viz., sweet, bitter, acid, and salt. Other flavours are really due to odorous emanations, carried up through the naso-pharynx to the posterior nares, especially in the expiration, which occurs immediately after swallowing. Loss of smell, therefore, interferes with the power of distinguishing certain flavours.

4. **Speech.**—The nasal cavity, including the naso-pharynx, exercises an important influence on voice and speech. It may be said to act as a reverberating chamber, the air within it being thrown into vibration by the voice sounds. In the pronunciation of vowel sounds and of most consonants, it is shut off from the mouth by the palate, but in pronouncing the consonants, *m*, *n*, or *ng*, air is allowed to escape through the nose. When, through perforation or paralysis, the soft palate is unable to shut off the nose from the mouth, articulation of most consonants becomes imperfect, and the vowel sounds are spoken with a nasal timbre, owing to the nasal cavity not being cut off, and the air therein being thrown into sympathetic vibration.

In order to exert their proper effect on the voice, the nasal cavities should have free communication with the outer air in front. If there is obstruction of the anterior nares only, it gives the voice a peculiar nasal character, owing to altered nasal resonance. This is especially marked in the sounds of *m* and *n*, which acquire the character known as “speaking through the nose.” If, however, the nasal passages or naso-pharynx be so encroached upon by swelling of the mucous membrane, new growths, or any other cause, that these cavities can no longer act as a reverberating chamber, the quality of the voice is *deadened* in all its tones, the nasal sounds cannot be properly produced, and the nasal consonants, *m* and *n*, tend to become respectively *b* and *d*.

5. **Hearing.**—Through the Eustachian tube the mucous membrane of the naso-pharynx is continuous with that of the tympanic cavity. The tube is usually closed, but it is opened at the moment of swallowing by the contraction of the fibres of the tensor palati muscle, and probably also of the levator palati, and salpingo-pharyngeus attached to it. This is also effected in a less degree by the movements of the palatal muscles in phonation. The air in the tympanic cavity is thus maintained at the same tension as the outer air. Any nasal, or naso-pharyngeal trouble, which directly or indirectly affects the Eustachian tube is liable to lead to ear troubles. Thus inflammatory conditions may extend from the naso-pharynx into the Eustachian tube, and thence to the tympanum. Growths in the naso-pharynx may directly occlude the Eustachian orifices, or may interfere with the movements of the palate muscles. Complete nasal obstruction is attended with ill-effects because, at each act of deglutition, air is exhausted from the tympanum, and the tympanic membrane is thereby drawn in.

The physiological bearing of the **accessory sinuses** is probably not fully known. The speculations of Braune and Clasen, of Paulsen, Kessel, and others, on the subject, are of doubtful import. It is obvious enough, however, that their presence in the bones affords a greater superficial area for the construction of the brain case and the face, combined with a given weight, than if the bones were solid; although it must be admitted that the difference, as compared with the total weight of the head, is very insignificant. It is probable that these cavities also act as resonating chambers for the voice sounds.

III.

GENERAL DIAGNOSIS.

I. SYMPTOMS AND EXTERNAL APPEARANCES.

Discharge.—The mucous membrane of the nose secretes, daily, a large amount of thin, clear fluid, which keeps the surface moist, and is absorbed constantly by the inspired air as it passes through the nose. The amount of secretion that is removed by blowing the nose is somewhat variable, within normal limits. It may be increased in diseased conditions to the extent of using one or more pocket-handkerchiefs daily, or to such an extent as to run in an almost constant stream from the nose. The discharge may be constant or intermittent. It may have a serous, mucous, muco-purulent, or purulent character. It may be very thick, and crusts of more or less hardness may be discharged. Secretions from the nasal passages may also be removed through the posterior nares. Morbid secretions from the naso-pharyngeal mucous membrane have usually a somewhat thick, tenacious, muco-purulent, or purulent character. Diminished secretion, and dryness of the nasal mucous membrane, are much rarer than the opposite condition.

Hæmorrhage.—Bleeding from the nose is a common symptom. The blood is usually discharged by the anterior nares, but it may pass back into the naso-pharynx, and be spat out or swallowed. In the latter case it may be subsequently vomited. The quantity of blood varies from a mere tinge in the secretion to an amount which threatens the life

of the patient. In hæmoptysis or hæmatemesis a portion of the blood may be ejected through the nose.

Nasal obstruction.—Respiration through the nasal passages may be obstructed in a greater or less degree, or totally; the obstruction may be constant or intermittent, and may affect one or both nostrils. The cause of the obstruction may be seated in some part of the nasal passages proper, or in the naso-pharynx. The patency of the passages should be tested by successively closing each passage, and directing the patient to breathe through the other. The sound of the air, as it passes to and fro, will give a fair estimate of the condition. It is well, also, to see if the patient can breathe with the mouth shut for any length of time. The subject of obstruction of the nose will be treated more fully in a special section.

Offensive smell from the nose.—The character of the breath should be examined as the patient exhales through the mouth only, and through the nose only. By this means it will be easy to determine if the smell really proceeds from the nasal or naso-pharyngeal passage, or elsewhere. The nose is by far the most frequent source of origin of an offensive breath. It may also be desirable to examine the breath, as the patient expires through each nostril separately. It is also useful to inquire if the odour is perceived by the patient as well as by those about him.

Impairment of the senses of smell and taste.—This is a symptom often complained of in nasal disease. If it be desired to test the sense of smell, pungent substances, such as ammonia, which excite the fifth nerve, must not be employed. Some essential oil, such as cloves, or peppermint, or substances like musk or camphor, must be used. Zwaar-demaker, of Utrecht, has constructed a simple and ingenious instrument which he terms an **olfactometer**, for testing the acuteness, or the degree of loss of the sense of smell. The instrument (Fig. 7) consists of a vulcanized gutta-percha

tube A, which contains the odoriferous substance; a graduated glass tube B, which extends through a screen C, and turns up at the end D to fit the nostril, and a handle which supports the whole instrument. When the ends of the tubes are in apposition no odour is perceived, and according as the gutta-percha tube is slid beyond the other, the intensity of the odour increases. The diminution in the acuteness of smell is read off in centimeters on the graduated glass tube.

Ear troubles.—These are very apt to arise in connection with disease of the nose or naso-pharynx. Deafness, ear-ache, noises in the ears, and otorrhœa may all originate in this way.

Altered voice.—Deficient nasal resonance, or “deadness” of the voice, inability to pronounce certain consonants, such as *m*, *n*, or *ng*, or a nasal twang of voice, may be present, and should direct attention at once to the condition of the nasal cavities or naso-pharynx.

Dryness of the throat.—This is a symptom frequently complained of, and may be chiefly subjective, or it may be attended with obvious dryness of the pharynx. A dry throat should always lead to an inquiry into the condition of the nose.

Remote symptoms.—Sneezing is a familiar reflex symptom of nasal irritation. Other affections, having a less

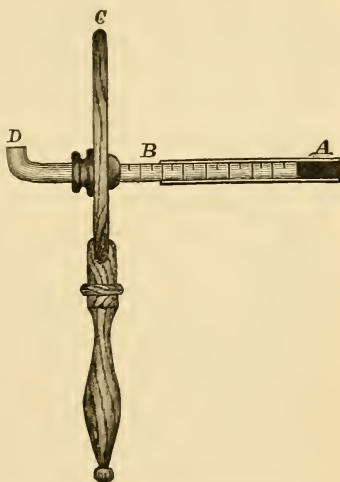


FIG. 7.—Zwaardemaker's Olfactometer.

obvious connection with the nose, may be due to diseases in that region, such are cough, asthma, giddiness, supra-orbital neuralgia, migraine, etc. (*See Reflex Nasal Neuroses.*)

Conformation of the external nose.—The appearance of the external nose will sometimes give indications of disease of the internal parts. It is rare for internal growths or swellings to cause deformity. Occasionally, however, the alæ may be bulged out by such conditions, or a swelling may protrude from the external orifice. A commoner appearance is a collapsed, pinched condition of the alæ, characteristic of long-continued mouth-breathing. The aspect of the face generally may be characteristic of habitual mouth-breathing. Deviation of the tip, or of the dorsum of the nose, or asymmetry of the orifices may indicate deflections of the septum. Falling in of the external nose, at the bridge, or below, may be present from injury or disease of the bony or cartilaginous framework of the nose. Redness and swelling of the tip, or alæ of the nose, are sometimes the result of diseased conditions of the internal parts, and excoriations of the edges of the orifices and of the upper lip are common results of nasal discharge.

Appearance of the pharynx.—This often gives indications of disease higher up. Dryness of the posterior wall, a dry, varnish-like coating of mucus on its surface, an atrophic appearance, adenoid granulations, muco-purulent secretion, obviously proceeding from the naso-pharynx, are all signs to be noted, and the value of which will be considered more fully in the description of the various diseases of the nose and naso-pharynx. Occasionally a new growth may project down below the soft palate, and be visible in the pharynx; and sometimes by simply raising the soft palate an ulcer on the posterior wall of the naso-pharynx may be brought into view.

2. ANTERIOR RHINOSCOPY.

In order to examine the nasal passages from the front the patient should be seated upright facing the observer. A bright, steady light should be placed at the side of the patient's head. The light most commonly employed, and which serves the purpose very well, is that from an argand gas-burner fitted with a metal chimney, and a bull's-eye condenser. Gas-light can be very materially improved by adopting the Wellsbach burner or the Albo-carbon method.

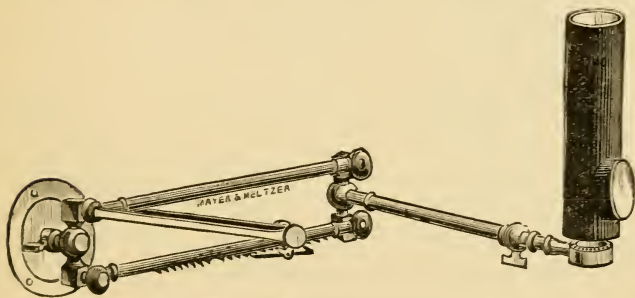


FIG. 8.—Mackenzie's Bracket.

Voltolini strongly recommends the Albo-carbon light. The oxy-hydrogen lime-light is, however, undoubtedly the brightest and best artificial light that can be used.

Whatever light is used the burner should be capable of being raised and lowered on the reading-lamp principle, or, still better, should be fitted on a Mackenzie's bracket with perpendicular and horizontal movement (Fig. 8).

The observer, sitting in front of the patient, wears a **reflector**, by means of which the light from the lamp is thrown on to the patient's face. This reflector is slightly concave, with a focus of about 12 to 14 inches, and is perforated with a hole in the centre. It is best to have it fixed to a spectacle

frame (Fig. 9), though some use a forehead band. The reflector may be worn over either eye, and the lamp is, on the whole, most conveniently placed at the right side of the patient's head.

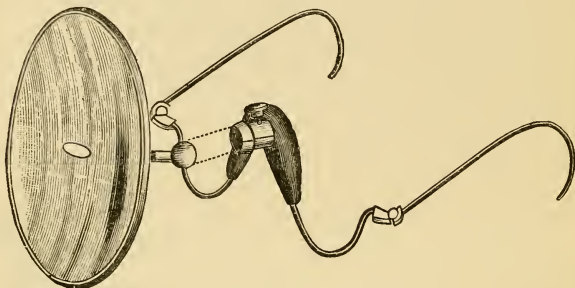


FIG. 9.—Reflector, with Spectacle Frame.

Sunlight is superior to any artificial light for illuminating the nasal cavities, but it is not sufficiently regularly at our disposal for general use. When we desire to utilize it, the device recommended by Bosworth* is the most convenient.

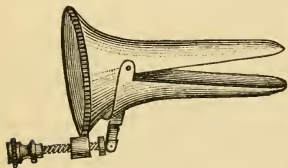


FIG. 10.—Duplay's Nasal Speculum.

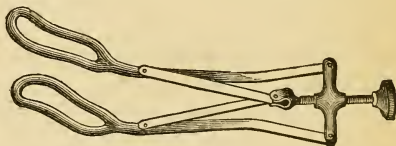


FIG. 11.—Fränkel's Nasal Speculum.

This consists in a plain mirror about four inches in diameter, mounted on an upright support, to which it is attached by a universal joint. This is to be placed in the window exposed

* "A Treatise of the Diseases of the Nose and Throat," Vol. I., New York, 1889.

to the sun, and turned in such a direction that the sun's rays are thrown on the forehead reflector of the operator.

Having concentrated a bright circle of light on to the patient's nose, we can obtain a view of the interior of the vestibule by getting the patient to tilt the head slightly back, and raising the tip of the nose with the thumb. To examine the nasal cavities thoroughly from the front, one or other of the various nasal specula must be used to dilate the cartilaginous portion. It is unnecessary to describe all the different kinds of specula that have been invented. Duplay's speculum (Fig. 10), is that which I believe to be most generally useful. It is made of polished metal, and is



FIG. 12.—Thudichum's Nasal Speculum.

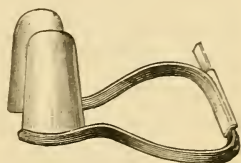


FIG. 13.—Lennox Browne's Nasal Speculum.

of bivalve form. When closed it forms a hollow cone, slightly flattened from side to side, and, by means of a screw, one blade is separated from its fellow at the distal end. The movable blade should, when inserted, be next the ala. Fränkel's speculum (Fig. 11), consists of two fenestrated blades, made of stout wire, which are gradually separated by working a screw at the end. Both blades may be inserted into one nostril, or one blade may be inserted into each nostril, and both nostrils dilated at once. Most operators use it in the former manner. Thudichum's speculum (Fig. 12), consists of two flattened blades, united by a bridge of flexible wire. The spring is too strong in most of those sold. If well borne, Thudichum's speculum is a very convenient one, and is self-retaining. Lennox Browne has

modified this speculum. He has the blades the same shape as Thudichum's, but made of ivory, and the connecting bridge is shortened or lengthened by a telescopic arrangement instead of a wire spring (Fig. 13).

Whatever speculum be used, it should be inserted gently, and the blades separated slowly, the patient's head being tilted slightly backwards while this is being done. The distance the speculum should be introduced, to afford a good view, varies in different cases, but it should not be far enough in to press on the anterior part of the inferior turbinate body. If a good beam of light is, meanwhile, thrown from the reflector into the dilated nasal aperture, a view of the interior of the nasal cavity is obtained. On the outer side, the anterior end of the inferior turbinate body will be seen. The patient's head should now be tilted forwards, and the inferior turbinate body, the inferior meatus, and the floor of the nose examined as far as possible. Next the patient's head should be tilted backwards, when the middle turbinate will be seen, above and behind the inferior, and the upper part of the nasal cavity can be explored. By turning the patient's face a little to one side or the other, a more or less complete view can be obtained of the septum, or of the parts on the outer wall. It is a good plan to hold the speculum with the left hand, and to guide the movements of the patient's head with the right.

Zaufal's speculum, or funnel, is a cylindrical tube, with a polished inner surface, dilated at the proximal end into a funnel-shaped mouth. It is made in three different sizes, to suit the varying capacity of the nasal passage. Before inserting it, the capacity of the passage is examined with an ordinary speculum. It is introduced gently along the inferior meatus, keeping the extremity, by preference, directed slightly towards the inferior turbinate body. The mucous membrane, as it presents at the orifice, during its course backwards, can be inspected. If the end gets blocked by

secretion, this can be removed by blowing into the tube, with the mouth, or with an india-rubber bag. Zaufal's speculum is chiefly useful for examining the Eustachian prominences and orifices, and the posterior wall of the pharynx.

Anterior Rhinoscopic View.—The actual extent of the structures seen varies in different cases. Deviations of the septum may restrict the view to almost any extent. Swelling of the anterior end of the inferior turbinate body may also much impede the view. Further, as Cresswell Baber* points out, the amount of the middle turbinate that will be seen in any given case depends greatly on the development of the thickening of the mucous membrane of the septum, known as the tubercle of the septum. When there is no unusual interference with the view the following parts will be seen:—

The convex surface and lower border of the inferior turbinate body can be traced backwards for a considerable distance, or even for the whole length, presenting a somewhat undulating character. The inferior meatus can be illuminated for a variable distance back, and if the head be well tilted forwards, the floor of the nasal cavity can often be traced to the posterior extremity. Its surface is usually uneven, especially in front. The mucous membrane on the inferior turbinate body has a somewhat velvety appearance, and a decided red colour,† especially at the anterior part. The floor of the nose has usually a duller red tint than the inferior turbinate body.

If a strong light be thrown along the floor of the nose, and into the space between the inferior turbinate body and the septum, the posterior wall of the pharynx will often be discerned. On directing the patient to swallow, the movement upwards of the levator cushion, and inwards of the salpingo-pharyngeal fold, can be perceived. In a tolerably

* "A Guide to the Examination of the Nose." London, 1886.

† With sunlight all the parts have a paler appearance than with gaslight.

capacious nasal cavity this is not difficult; but these movements can be more clearly inspected with a Zaufal's speculum. Above the inferior turbinate body, and farther back, the anterior part of the middle turbinate body will be seen. The pale, shining appearance of this body will contrast with the inferior turbinate. The anterior vertical border, which varies much in thickness, and the angle between this and the inferior border, are the parts most plainly seen. If both the inner and the outer margin of the anterior border are seen, one often gets the impression of a body descending from the roof, instead of one curving downwards from the outer wall of the fossa. The anterior border will not, however, be always seen in its whole thickness. If the thickening on the septum, previously referred to as the tubercle, be well marked, the inner margin of this border will be hidden from view, and it will then often seem to touch the septum, although such may not really be the case. If, however, the tubercle be slightly marked, or absent, the whole thickness of the anterior border, and part of the inner surface of the middle turbinate body, will be visible. Between this surface and the septum is the narrow space known as the olfactory slit, the upper part of which can rarely be illuminated. Running back from the angle is the inferior border of the body, which, with the middle meatus, can be illuminated for a variable distance. Variations in the form of the middle turbinate are very often seen. Thus the inner surface facing the septum, instead of presenting a convex form, may be concave, thus widening the olfactory slit. The anterior extremity of the bone may form a large inflated protuberance, which may be in contact with both the septum and external wall.

With the patient's head well thrown back, the fore part of the roof will be brought into view, but the superior turbinate body can rarely, if ever, be seen by anterior rhinoscopy; the superior meatus never.

A swollen condition of the erectile tissue on the anterior part of the inferior turbinate body is a common interference with the view in anterior rhinoscopy. This body then presents a smooth, rounded prominence, often of a very pale colour, which may touch the septum, and completely obstruct the inferior meatus. With pressure from a probe, this swelling indents readily, the indentation immediately disappearing on removal of the pressure. The swelling can, however, be rapidly reduced, and a good view of the deeper parts obtained, by painting the surface with a five per cent. solution of cocaine. The application of cocaine not only reduces erectile swelling, but causes ischæmia and a certain amount of contraction of the mucous membrane generally and is a most valuable aid in assuring a thorough rhinoscopic examination.

3. POSTERIOR RHINOSCOPY.

The patient is seated as for anterior rhinoscopy. The illumination is obtained in the same manner, a strong circle of light being concentrated on the palate and back of the pharynx. A preliminary inspection of the fauces should always be made, with or without the use of a tongue depressor. While doing this the condition of the soft palate, whether hanging down, well away from the posterior wall of the pharynx, or not, will be noticed, and will afford some idea whether a rhinoscopic examination can be made with ease or difficulty.

In order to examine the naso-pharynx a small mirror is used. Various forms of rhinoscopic mirrors have been invented. One, which is very commonly used, exactly resembles a small laryngeal mirror. The shaft, however, should be attached to the mirror at more nearly a right angle, although, for examining the posterior wall and vault, the ordinary angle of the laryngeal mirror is more convenient. The

mirror should be about half or five-eighths of an inch in diameter, but it is useful to have two sizes. It is convenient to have the shaft slightly bent, so as to follow the curve of the tongue. Another form of mirror, and, I think, unquestionably the more convenient, is that shown in Fig. 14. In this instrument the mirror is in the same horizontal plane as the shaft, and can be raised to any angle by pressing a spring in the handle.

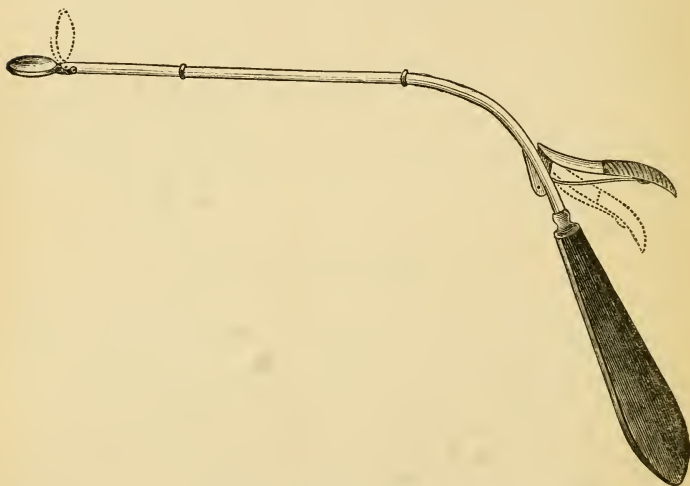


FIG. 14.—Rhinoscopic Mirror.

In order to use the rhinoscopic mirror satisfactorily, it will generally be necessary to employ some means for keeping the tongue down. A depressor which has the handle at right angles to the blade, when in use, is the best. Türck's tongue depressor (Fig. 15) is very well adapted for the purpose. It is important to press the base of the tongue steadily downwards and forwards. This is not always an easy matter, but much depends upon this being well done. Less often a rhinoscopic examination can be made with-

out a depressor, the shank of the mirror serving the purpose.

The patient sits erect, with the head inclined slightly forwards, and the mouth widely open, and is directed to breathe quietly and naturally. The light is concentrated on the palate and pharynx, and the rhinoscopic mirror, previously warmed, is introduced *rapidly* from the corner of the mouth with its reflecting surface upwards, to one or other side of the uvula until it lies behind the velum, in the middle line close to, but not touching, the wall of the pharynx. By depressing the handle, or pressing on the spring, the mirror can be made more vertical, and, by various movements of the mirror, the different parts can be successively brought into view.

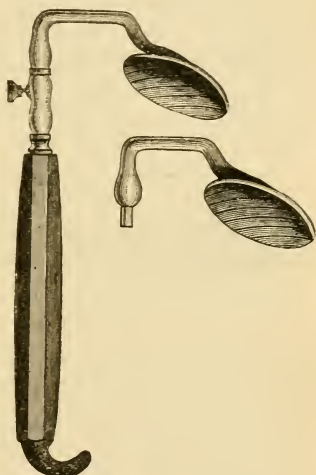


FIG. 15.—Türck's Tongue Depressor.

Certain difficulties may present themselves in the examination. A long hard palate which approaches so nearly the pharyngeal wall, as to leave very little space, may render a rhinoscopic examination impossible. A very common difficulty is the drawing up of the uvula and soft palate against the pharyngeal wall, as soon as the tongue is depressed, or the mirror introduced. To avoid this as much as possible, the patient should be directed to breathe *steadily and quietly through the nose*, and to continue to do so while the examination is being made; and although this may be impossible when the tongue is depressed and separated from the soft

palate, still the effort to continue breathing through the nose will usually cause the soft palate to hang away from the pharyngeal wall. Forced inspiration must be avoided. If the effort to breathe through the nose does not succeed in getting the soft palate forward, an attempt should be made to effect this by getting the patient to emit the French nasal sound *en* or *on*. This will often succeed in giving a view of the parts. If there is great irritability of the pharynx, much training of the patient may be required, before a complete examination can be made. Painting the edges of the soft palate and fauces with a ten per cent. solution of cocaine will diminish the irritability, but too much must not be expected from cocaine in posterior rhinoscopy, any more

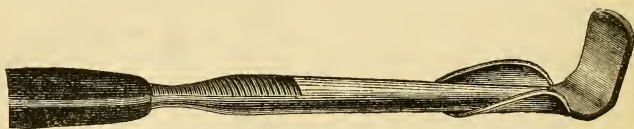


FIG. 16.—Voltolini's Palate Hook.

than in laryngoscopy, as with some patients much of the irritability is of mental origin. A steady, skilful hand, and patience, will accomplish much, and as our experience grows, the number of cases which we are unable to examine diminishes.

However, there are cases where the depth of the pharynx is small, and the soft palate is long, and the uvula long and broad, and where an examination can only be made by drawing the palate and uvula forward by mechanical means. For this purpose Voltolini's palate hook (Fig. 16) can be used. The patient depresses his own tongue with the spatula, so as to leave both the operator's hands free, or a self-retaining tongue depressor, such as that of Ash, may be employed. The hook is to be introduced rapidly, and the palate hooked up and drawn forward, the end of the hook

being pressed against the floor of the choanæ. Rapidly applied, firm pressure causes less reflex irritability than light contact. Some training will generally be required before the application of the palate hook is tolerated without exciting spasmodic contraction. Painting the parts with cocaine much facilitates the use of the palate hook.

White's self-retaining palate retractor (Fig. 17) is a useful instrument. The hook consists of a loop of silver wire, which can be changed in shape to suit the individual case. A clamp slides on the shank, carrying two loops of silver wire, which catch over the upper lip at each side of the nose, and retains it in position, thus leaving both hands of the operator free.

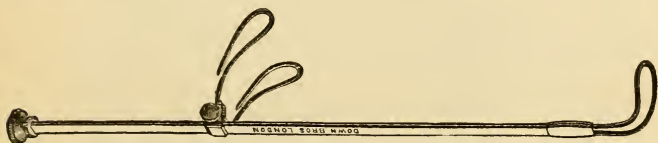


FIG. 17.—White's Self-retaining Palate Retractor (slightly modified by Baber).

In difficult cases where, for diagnostic or operative purposes, it is desired to get the palate well forward, and under control, the method originally suggested by Störk, of tying the palate forward, may be adopted. For this purpose a piece of cord or catgut, or, better still, of small rubber tubing, is passed through each nostril, and the ends brought out through the mouth. The palate having been drawn forward, the ends are tied over the lip, or passed over the ears, and tied behind the head. This is not a very difficult procedure, and if accomplished quickly and skilfully, is not so disagreeable to the patient as might be imagined.

In cases where an enlarged uvula constitutes the chief hindrance to posterior rhinoscopy, Morell Mackenzie recommends drawing the uvula forward by means of a "twitch," consisting of a small loop of string threaded through a rod

four or five inches long. The uvula is engaged in the loop, and a few twists of the rod secure it.

The Rhinoscopic Image.—Only a very limited portion of the boundaries of the post-nasal space is seen reflected in any one position of the rhinoscopic mirror. The mirror has to be shifted in various directions, and possibly withdrawn and re-introduced several times in order to travel over the whole of the picture. A nearly median position is best to take up at first, though that is not always possible, and the mirror may have to be introduced at one side of the uvula first, and

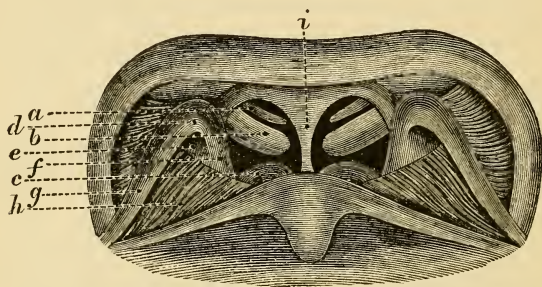


FIG. 18.—Diagram of the Posterior Rhinoscopic Image. (From Burnett after Zaufal.)

a, Superior turbinate body; *b*, middle turbinate body; *c*, inferior turbinate body; *d*, Eustachian cushion; *e*, orifice of Eustachian tube; *f*, salpingo-palatine fold; *g*, salpingo-pharyngeal fold; *h*, levator cushion; *i*, nasal septum.

then withdrawn and re-introduced on the other side. As in laryngoscopy, where the vocal bands are sought, and serve as a landmark for that region, so in posterior rhinoscopy, the septum is easily recognized, and serves a similar purpose. When the mirror is first raised into a nearly vertical position, the posterior surface of the uvula and soft palate is brought into view. By inclining the mirror more towards the horizontal direction the septum appears as a sharp, thin ridge of a whitish colour. Above it widens out, and is of a somewhat redder colour. The lower end of the septum,

where it widens as it merges into the floor, is more or less hidden by the thick upper part of the soft palate. By turning the mirror a little sideways the ovoid openings of the nasal fossæ are brought into view, on either side of the septum (Fig. 18). Each opening, or choana, is in great part occupied by the posterior ends of the turbinate bodies, which project towards the septum from the outer wall. The most conspicuous is the middle turbinate body, which forms an elongated projection, narrowest at its attachment to the outer wall, and enlarging gradually, as it extends inwards and somewhat downwards, towards the septum. Its inner septal surface may be traced for a little distance forwards. The inferior turbinate body is seen below the middle, forming a rounded prominence, the lower part of which is nearly always concealed by the palate, so that the body has the appearance of rising up from the floor of the cavity. Above the middle turbinate body, the superior turbinate is generally seen, forming a narrow projection, not reaching so far inwards as the middle turbinate. The turbinate bodies, as seen in this posterior view, have an ashy-grey colour, less often a pale red colour. The surface of the inferior turbinate is usually uneven, or somewhat corrugated. Portions of the middle, and of the superior meatus, can be seen, but the inferior meatus is concealed by the soft palate.

By inclining the mirror to one side a rounded projection is seen of a bright red colour, the Eustachian cushion, forming the upper boundary of the depression leading to the Eustachian tube. This depression has a triangular form, the sides being formed by the salpingo-palatine, and the salpingo-pharyngeal folds, passing down in front and behind from the Eustachian cushion. These folds, and the levator cushion which forms the lower boundary of the depression, may be better defined by viewing them in the position of the mirror recommended by Zaufal, viz., low down, with its back against the opposite tonsil. The Eustachian promi-

nence, which is about on a level with the inferior turbinate body, mostly appears at a higher level in the rhinoscopic image. On the outer side of the Eustachian cushion is the depression known as Rosenmüller's fossa.

By bringing the mirror to a more nearly horizontal position, the vault of the naso-pharynx is brought into view. This usually presents an irregular surface, with elevations and depressions, like the surface of the tonsil, owing to the existence of the mass of adenoid tissue known as Luschka's tonsil (Fig. 6). This glandular tissue, marked in some cases, absent in others, may extend towards the Eustachian cushion on each side, and is continued, for a greater or less distance, down the posterior wall. Below this the mucous membrane of the posterior wall may be followed, smooth, deep red, and shining. At the lower border of the pharyngeal tonsil, in the middle line, a small opening is generally to be recognized. This, as may be ascertained with a probe, is the orifice of a recess which leads up, beneath the tonsil, the so-called pharyngeal bursa.

4. PALPATION.

Digital palpation through the **anterior nares** is rarely resorted to. Palpation with a probe is, however, very frequently needed, and is indeed often indispensable to supplement the anterior rhinoscopic examination. It enables us to determine the consistence of mucous membrane swellings, and the attachments of new growths, as well as to diagnose foreign bodies, dead bone, and rhinoliths. An ordinary surgical probe of a good length, and bent at a suitable angle, will serve the purpose, or a bent probe mounted on a handle may be found more convenient. Digital palpation of the **naso-pharynx** is an extremely important method of diagnosis, and when, as in children, posterior rhinoscopy is difficult, or impossible, we have to

depend upon it for much of the information which would otherwise be derived from posterior rhinoscopy.

For the purpose of this examination the patient is seated, and the operator stands facing the patient's right side. With his left arm passed round the patient's head, he steadies the latter, while the corresponding hand is free to rest on the patient's chin. The right forefinger is then passed rapidly to the back of the pharynx, between the uvula and pillar of the fauces, and then, with the palmar surface forwards, is carried upwards behind the soft palate. The finger will now feel the hard ridge of the septum nasi in front, and it should be pushed along till it reaches the vault. There is sometimes a little difficulty in getting the finger up behind the soft palate, owing to the contraction of the parts, which takes place when the finger reaches the pharynx. The finger must be kept well against the posterior wall, and gently insinuated by a rotatory motion behind the palate, at one side or other of the uvula. When the finger gets up behind the velum, it is generally grasped rather firmly by the contraction of the parts. This contraction will often relax in a few seconds, but if it does not, the finger must, nevertheless, be pushed boldly upwards, making sure that it reaches the roof of the space. The uneven surface of the roof will now be felt, and any undue development of the adenoid tissue in that region will be recognized. The Eustachian cushion, and orifice, and Rosenmüller's fossa can be felt. On either side of the septum the posterior ends of the middle and inferior turbinate bodies can be examined, the latter being the more prominent, and having a soft cushiony feel to the finger.

The exploration should be made rapidly, as it is always more or less disagreeable to the patient. It requires considerable practice to thoroughly appreciate the condition of the parts during a rapid examination. The examination should be conducted as systematically as possible; the

roof being first examined, then the right lateral wall, the right and left posterior nares, and the left lateral wall successively, and finally the palmar surface of the finger is to be swept across the posterior wall. It is not necessary to place a gag between the teeth. There is no risk of being actually bitten while the finger is in the naso-pharynx, but sometimes the lower incisor teeth exert pressure on the finger and hurt it. The operator's left hand pressing on the patient's chin somewhat checks this, but it is as well to wear an india-rubber or leather covering on the proximal phalanx. This should cover the metacarpo-phalangeal joint, as this part is often pressed on by the lower incisor teeth. This precaution is more necessary if it is intended to scrape away with the finger-nail any vegetations that may be felt. Painting the fauces and naso-pharynx with a ten per cent. solution of cocaine renders the digital examination of this region less disagreeable to the patient.

A probe is sometimes useful to ascertain the condition of parts seen in the rhinoscopic image. A longish silver probe fitted into a light handle, and bent at about right angle, about an inch and a half from its end, is the most convenient form.

IV.

METHODS OF TREATMENT.

1. FLUID MEDICATION AND CLEANSING.

FLUIDS are frequently introduced into the nasal passages, and naso-pharynx, mostly for cleansing purposes. They may

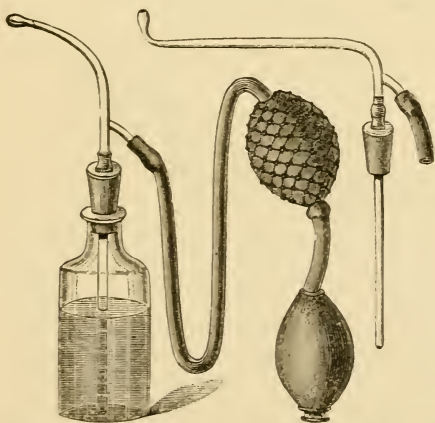


FIG. 19.—Spray-Producer, with Nozzle for Anterior and Posterior Nares.

be applied with a spray-producer, a douche apparatus, or a syringe, or simply drawn up from the palm of the hand or a cup.

Spray-Producers.—A spray is in general the best form for the application of fluids to the interior of the nose, whether

the object be to cleanse the cavity of crusts and secretions, or to bring certain indicated fluids in contact with the mucous membrane. The spray-producers most commonly used are worked by an india-rubber hand-ball. Except in cases where the quantity of fluid to be introduced is very limited, a second more elastic ball is useful, between the hand-ball and the spray-bottle, in order to establish a continuous spray. Powerful spray apparatus have been designed by American physicians, worked by compressed air in a metal cylinder, charged by means of an air-pump.

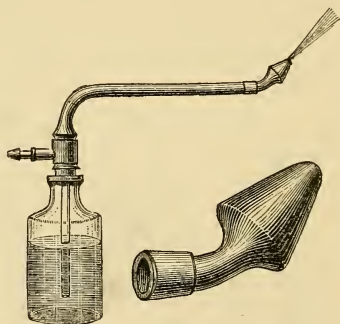


FIG. 20.—Lefferts's Spray-Producer, with Conical Nozzle.

The direction of the spray-tube will vary according to whether the spray is to be directed through the anterior or posterior nares (Fig. 19). The anterior nasal spray-producer is most often used, as by its use the nasal passages as well as the naso-pharynx can generally be thoroughly treated. A narrow nozzle which can be introduced a little distance into the nasal cavity is usually best, but the end should be blunt and rounded, so as not to hurt the parts if it come in contact. A conical nozzle (Fig. 20) which accurately fits the orifice of the nostril is often more useful when the object is to clean the passages of crusts and secretions. For this purpose, too, a spray-producer throwing a powerful *coarse*

spray is the most efficient. Many of the spray-producers sold throw far too feeble a spray to be of much use for cleansing purposes.

Fluids used for spraying the nasal passages should be slightly warmed, about the body heat. This can be done by standing the bottle, containing the fluid, in warm water for a few minutes.

Lefferts* gives the following practical directions for cleansing the nasal cavities with the spray :—

1. Warm the medicated fluid in the bottle before using, by holding the bottle for a few minutes in hot water.

2. Hold the body erect, and incline the head very slightly forward over the toilet basin.

3. Introduce the conical nozzle of the apparatus into the nostril, first on the side most occluded, far enough to close it perfectly, holding at the same time the horizontal tube of the apparatus directly outwards from the face; do not turn it from side to side or downwards.

4. Open the mouth widely, and breathe gently through it, in a snoring manner; avoid all attempts at speaking, swallowing, or coughing. At the moment that the fluid passes from the nostril operated upon, into the upper part of the throat, a desire to swallow will be experienced; resist it; and the next second the fluid will pass forwards through the opposite nostril.

5. Hold the ball of the apparatus firmly in the right hand, while the left holds the bottle, and work it briskly, until the spray of medicated fluid, which should be felt at once to enter the nasal passage, has passed around it, and appears at the opposite nostril; stop at this moment.

6. Remove the nozzle from the nostril; allow the superfluous fluid to run out of the latter, and blow the nose gently, *never vigorously*.

7. Repeat the operation upon the opposite nostril.

* Ashurst's "Encyclopædia of Surgery," vol. v.

Oily liquids diffused through the nasal passages, in a finely pulverized form, are sometimes found beneficial, especially in softening and preventing the formation of crusts. Spray-producers, specially constructed for the pulverization of oily liquids, are sold by instrument makers. Fig. 21 represents a small spray-producer, supplied for the purpose by Messrs. Mayer and Meltzer. The spray-tube is made of glass, and the apparatus is worked by a single hand-ball.

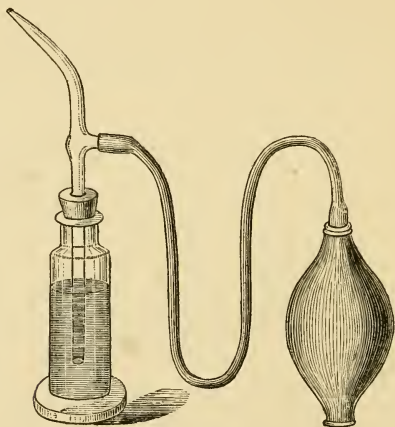


FIG. 21.—Spray-Producer for Liquid Vaseline, etc.

Nasal Douche.—When a stream of fluid is propelled into one nostril, while the patient sits up and breathes through the open mouth, the liquid passes over the contracted soft palate, and out through the opposite nostril. On this principle a stream can be passed through the nasal passages by using an india-rubber tube, with a nozzle at one end, fitting into the nostril, the other end being placed in a vessel of water, raised above the level of the patient's nose. In the ordinary simple form of apparatus (Fig. 22) the tube is filled by suction, or by pouring the fluid into it.

A more convenient form of douche is also made containing an elastic ball in the circuit of the tube, by which the fluid can be sucked in, and a stop-cock, by which the stream can be cut off when required.

The nasal douche is no doubt an effectual method of irrigating the nasal cavities, and of removing crusts and secretions. The stream, however, passes along the floor of the cavity, and does not act on the mucous membrane high up, unless indeed it enters at a high pressure. It is acknowledged that a stream entering thus, with great force, is apt

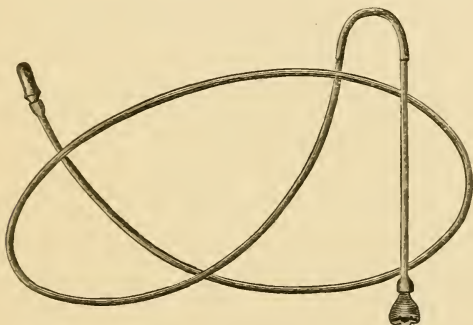


FIG. 22.—Nasal Douche.

to pass into the Eustachian tube, and even into the frontal sinus, and to set up troubles in those parts. It is probable that this danger is exaggerated. Partly from this danger, and partly because the spray is more agreeable to the patient, the douche has fallen somewhat into disuse of late. If the following directions are observed the douche is a safe and effectual method of cleansing the nasal passages.

(1.) Too high a pressure of fluid must not be used. The vessel containing the fluid should not be raised higher than the forehead. (2.) The head is to be kept in the upright position, or inclined slightly forwards. A too forward, or too backward position, favours the entry of fluid into the

frontal sinuses, and the Eustachian tubes, respectively. (3.) The patient is to avoid swallowing, and for this purpose it is well to interrupt the stream frequently, until the patient has become habituated to its use, and has learned to breathe easily through the mouth, while the stream is passing through the naso-pharynx. (4.) If one nasal passage is narrower than the other, the stream should be directed into the narrower passage, so as to secure a free exit. If either passage is completely obstructed, of course the douche is out of the question. (5.) The superfluous fluid should be allowed to escape before blowing the nose. (6.) The fluid used should always be slightly warmed, and should not be too highly medicated.

As to the quantity to be used, about half a pint is sufficient, until the patient has become proficient, afterwards, a pint or more may be used, each time.

Syringes.—Fluids may be conveniently directed into the nasal passages with a syringe. As a means of removing crusts, syringing is an easy and effectual proceeding. An ordinary glass, metal, or vulcanite piston syringe, or a Higginson's enema syringe answers the purpose for the anterior nares. If the patient breathe through the open mouth, while the syringe is being used, the fluid will pass down the other nostril. A syringe with an olive-shaped nozzle, preventing the return of fluid, is the most effectual, but care must be taken with this instrument not to use too great force. Most of the precautions just mentioned in connection with the douche apply here. In cases where there is obstruction, a syringe with a narrow nozzle, which will permit the free return of fluid, is safer.

An ordinary barrel syringe with a long, curved tube is used for the posterior nares. The nozzle should have coarse perforations so directed that when in place it may throw a stream directly forwards, or, better still, in all directions. The post-nasal syringe is the most effectual means of remov-

ing firmly impacted crusts from the vault of the pharynx, in ozæna, etc.

Hand Washes.—In poor practice, where apparatus cannot be obtained, or as a temporary expedient, fluid may be introduced by drawing it up from the hollow of the hand, into the nose and naso-pharynx, and spitting it out. Instead of the hand a glass or spoon may be used. The patient should be directed to hold the head well forward at first while snuffing it up, and then gradually to throw it back. Another simple method by which fluids can be brought in contact with the naso-pharynx and nasal passages, is for the patient to take a mouthful, and hold the head back as if to gargle. By closing the mouth, and throwing the head quickly forwards, the fluid can, with a little practice, be made to come out through the nose.

2. INSUFFLATION OF POWDERS.

Finely pulverized medicaments are often brought in contact with the lining membrane of the nasal passages through

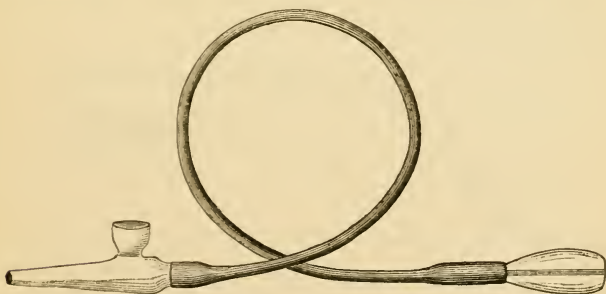


FIG. 23.—Nasal Insufflator.

the anterior or posterior nares. The powder may be taken in the form of snuff, but a more effectual method is to blow

it in, by means of some form of insufflator. Simple insufflators for the anterior nares are made with a glass or vulcanite tube provided with a piece of india-rubber tubing and a mouthpiece (Fig. 23). The powder is inserted into the tube through an opening near the nasal end, and this opening is then closed with the fingers. For the naso-pharynx a long curved tube is used, with an opening in the side for the insertion of the powder, and fitted at the proximal end with a piece of india-rubber tubing (Fig. 24).

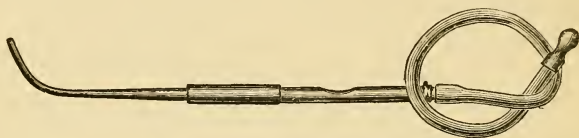


FIG. 24.—Naso-pharyngeal Insufflator.

Other insufflators are made, constructed like spray-producers. They are worked by a hand-ball, and are fitted with nozzles for insufflation through the anterior or posterior nares.

3. APPLICATIONS WITH BRUSHES AND CAUSTIC HOLDERS.

A brush is sometimes used to make direct applications to the nasal passages or to cleanse the parts. A soft brush

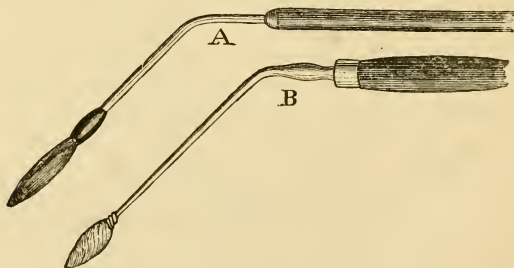


FIG. 25.—A, Nasal Brush ; B, Cotton Holder.

with the handle bent, as in Fig. 25, A, is the most convenient for the anterior nares. For the naso-pharynx the handle

should be bent at a right angle. The same purposes are generally served better by means of a dossil of cotton-wool, on the end of a similarly bent probe or cotton holder (Fig. 25, B). Nitrate of silver is best applied by fusing it on the end of a probe, or metal rod, bent at a suitable angle. This is safer than using a caustic holder, especially for the nasopharynx. Chromic acid can also be melted on the end of a probe, but this substance must be cautiously heated, as too great heat will decompose it. Chromic acid crystals, however, being deliquescent, will adhere readily to the end of a probe, without heating. Chromic acid in solution, acetic acid, and other fluid escharotics, may be applied with a glass rod, a probe dressed with cotton, or with Andrew Smith's guarded canula.

4. GALVANO-CAUTERIZATION.

The galvanic cautery is a very efficient method of treating many nasal diseases. It is especially useful for the reduction of hypertrophic conditions in the nasal passages. Convenient portable batteries can be bought at a moderate cost. A set of Schech's electrodes, including two tubes for the wire snare, a pointed cautery, a blunt cautery, and two flat blades, comprises nearly all that is necessary. These electrodes are all adapted for fastening into a universal holder, of a very convenient make.

In using the galvano-cautery it is important to remember that a cherry-red heat is the proper one. A very intense heat is liable to be followed by hæmorrhage, while too little heat is painful. The electrode should also, as far as possible, be kept slightly in motion as the current is turned off, otherwise it adheres to the burned tissues as it cools, and when removed is apt to tear the tissues and cause hæmorrhage. If it is felt adherent, it is best to turn on the current again, before withdrawing it.

5. LOCAL ANÆSTHESIA.

The utilization of the anæsthetic effect of cocaine, on the mucous membranes, has been of the greatest service in nasal therapeutics. Solutions of hydrochlorate of cocaine can be applied to the interior of the nasal passages with a brush or cotton holder, or with a fine spray-producer. The former method is preferable. The strength of the solution should not be less than ten per cent. in order to produce anæsthesia of the part. I have found that strength answer well for most purposes, but no doubt complete anæsthesia is more thoroughly assured with a twenty per cent. solution. The full effect is produced in four or five minutes after the application, and continues for about ten or fifteen minutes, and the effect mostly disappears within half an hour. In painful operations, such as the application of caustics or the galvano-cautery, it is well to paint the part twice over, at an interval of about two minutes, and then to wait about three minutes. The anæsthetic effect is limited to the part touched by the solution.

In addition to the anæsthetic effect, cocaine produces temporary contraction of the blood-vessels, in the parts to which it is applied. This ischæmia, which is especially marked on the cavernous tissue, gives increased facility for inspection and manipulation. A four or five per cent. solution is sufficient for this purpose.

The application of cocaine to the nasal mucous membrane is occasionally, though very rarely, followed by general toxic symptoms, such as faintness, giddiness, dryness and constriction of the throat, dilatation of the pupils, rapid pulse, and slight cyanosis. These symptoms soon pass off, and need not occasion alarm. We must not too readily attribute to the action of cocaine every case of faintness and giddiness and the like which occurs, for similar symptoms may arise

after intra-nasal manipulation where no cocaine has been used.

Menthol has a local anæsthetic effect on the mucous membranes. It also reduces the erectile swellings, and swelling of the mucous membrane generally, but neither this effect, nor the anæsthesia, is so complete as with cocaine. Menthol is only sparingly soluble in water, but is freely soluble in rectified spirit, and to the extent of twenty per cent. in olive oil. A twenty to fifty per cent. solution in spirit painted on the mucous membrane produces anæsthesia and contraction of the vessels. The immediate effect of this application is, however, often painful. A twenty per cent. solution in olive oil irritates much less.

V.

CUTANEOUS AFFECTIONS.

ONLY a few points need be referred to in connection with affections of the skin which covers the external nose, and lines the vestibules, as these affections in general follow the same course and require the same treatment as those which attack the skin of other parts of the face.

Eczema, just inside and around the orifices of the nose, is common, especially in children. It is often dependent on some nasal discharge. It frequently assumes the pustular variety, and crusts form and block up the apertures. The neighbouring skin of the nose and upper lip may be very much swollen, and in long-standing cases may become chronically thickened and infiltrated. An erythematous form of eczema often affects the skin of the nose in adults, and is generally very obstinate. The treatment does not differ from that of eczema elsewhere. The removal of crusts from the nasal orifices must be especially attended to. If eczema be dependent on nasal discharge, the condition of the interior of the nose must be simultaneously treated.

Small **cracks** or **fissures** often form in the skin at the orifices of the nose. They occur usually in the angle between the ala and columna in front, or between the ala and fore part of the floor of the nose behind. Such cracks may be very chronic, and difficult to heal. Their origin sometimes dates from an attack of eczema. They are also frequently associated with, and dependent upon, some increase in the secretions from the nasal cavity, such as occurs in chronic

rhinitis, polypi, etc. The treatment consists primarily in remedying any morbid condition of the nasal secretions. Dilute citrine or white precipitate ointment is the best application to the fissure. The more chronic fissures should be touched from time to time with a pointed stick of nitrate of silver, until healing occurs.

Acne rosacea is a familiar and troublesome affection of the skin of the external nose. Three grades of the disease are recognized, but many cases never pass beyond the first, and very few pass beyond the second grade. The earliest stage consists of redness of the nose. This redness is transitory at first, appearing perhaps only after meals, or about the menstrual period in women, but after a time it becomes permanent, and small dilated veins become visible about the tip and alæ of the nose. The nose, at the same time, has often a greasy appearance, owing to the presence of more or less seborrhœa, and many of the ducts may be seen plugged with sebum. After months or years the second stage is reached, in which, in addition to the rosacea, or permanent hyperæmia, there is true acne; papules, pustules, and tubercles developing, which can mostly be shown to originate in the sebaceous glands. These papules or pustules may be many or few in number. Some thickening of the skin of the tip, and alæ of the nose, is also present. The third stage, which is not often reached, consists in a marked hypertrophy of the tissues of the skin, the blood-vessels being at the same time enormously distended, and the parts of an intensely red or purple colour (**Acne Hypertrophica**). In extreme cases, the growth of connective tissue and blood-vessels goes on to the production of very great deformity. The nose may be converted into a large red, or purple, uneven, tuberculated, or lobulated mass.

This affection occurs in both sexes, but the lesser grades are more frequent in women, while the more marked forms are usually only reached in the male sex. Uterine disorders

are frequently the cause in women, and the disease is especially common about the menopause. Dyspepsia undoubtedly in many cases gives rise to acne rosacea, the dyspepsia being characterized in such cases by a tendency to flushing after meals. Excess of alcohol is a frequent cause of acne rosacea, especially of the advanced stages. Feeble circulation, debility, nerve prostration, exposure to inclement weather, are all, at times, important factors in its production.

While all the above causes, and some others, may contribute to the development of acne rosacea, it is of principal importance here to point out that the complaint, more especially the first stage, is sometimes due to intra-nasal disease, chiefly to the various forms of chronic rhinitis, and may be cured by treatment of the same; while so long as the nasal disease is unrelieved other remedies for the acne have little or no avail. The nervous and vascular connection between the mucous membrane of the nasal passages, and the integuments of the nose, will probably account for the interdependence, which, whatever be the explanation, certainly exists.

In treating the disease the cause must, as far as possible, be determined and remedied. While, therefore, we direct our inquiries to the subject of the patient's habits, diet, digestion, and catamenial functions, the condition of the interior of the nose must not be altogether forgotten. Where there are obvious nasal symptoms our attention will be more readily directed to the interior of the nose as a probable cause. But even, where the symptoms are of a latent character, a careful examination of the interior of the nose ought not to be omitted, in any obstinate case of the affection. Treatment of the nasal trouble may of itself cause the disappearance of the cutaneous redness. In most cases we have to treat other causative conditions. Attention to the diet is always important. Alcohol is, mostly,

better avoided altogether. Medicinally, soda, bismuth, calumba, and gentian, in various combinations, are most useful. Constipation should be corrected. The uterine functions should be regulated. Local treatment is often important. In proportion to the implication of the sebaceous follicles, weak sulphur ointments and lotions are useful; these are best applied at night, after washing the skin with soap and hot water. In the day a more soothing application, such as a calamine or bismuth lotion, may be applied. Dilated vessels are best treated by incision, or electrolysis.

Of a different nature from acne rosacea is the general thickening and enlargement of the nose which is sometimes observed, more especially in children and young people, resulting from what are often described as frequently recurring attacks of erysipelas. The upper lip and neighbouring part of the cheeks may suffer from the hypertrophic thickening as well as the nose. The attacks occur at intervals of days, or weeks, or months, the swelling of the parts not always subsiding in the intervals between the attacks. After a variable time the susceptibility to the attacks disappears, but a more or less marked permanent thickening of the nose, and adjacent parts, may remain. The attack, when originating on the nose, usually commences on one or other side of the dorsum, with redness and swelling, which spreads thence on to the cheeks and upper lip. After three or four days the redness and swelling subside, slight desquamation of the skin sometimes following. There are little or no constitutional symptoms. Whether these attacks, which may be termed **lymphangitis**, are identical with true erysipelas, though of slighter intensity and more fugitive character, is doubtful. Moldenhauer* rightly lays stress on the frequency with which we find cracks in the skin about the anterior nares, associated with the tendency

* "Die Krankheiten der Nasenhöhlen," etc. Leipzig, 1886.

to these attacks. Such cracks may obviously form a point of entry for erysipelatous or other poisons, into the lymphatics of the skin. There is, indeed, no doubt about the frequent association between cracks in the skin of the nostrils or upper lip, and the attacks in question, and such cracks should always be carefully treated, especially by applications of solid nitrate of silver. Other observers have traced a connection, in certain cases, between these attacks and chronic rhinitis, and other intra-nasal disorders, especially when these disorders are associated with a tendency to distension of the cavernous tissue on the turbinate bodies.

Sycosis may attack the hair follicles within the vestibule in conjunction with those of the upper lip. Very occasionally it may occur independently of the latter. It results in many cases from the irritation of some chronic, or oft-recurring, nasal discharge. The treatment is the same as for sycosis elsewhere, except that epilation is more painful, and cannot be employed except for the looser hairs, without a danger of setting up an undesirable amount of local irritation and swelling.

VI.

ACUTE RHINITIS (Acute Coryza, Acute Nasal Catarrh).

Causation and Nature.—Of all the mucous membranes that of the nose has the greatest tendency to catarrhal inflammation. Some persons possess a peculiar liability to nasal catarrh. This liability is sometimes due to a constitutional predisposition to catarrhal affections of mucous membranes, such as is seen in scrofulous subjects. Children are more prone to the complaint than adults. Very often the predisposition to acute rhinitis is due to abnormal conditions of the nasal passages, such as deflections of the nasal septum or mucous polypi; but the most frequent abnormality present, in such predisposed persons, is chronic hypertrophic rhinitis.

The commonest exciting cause is catching cold by exposure to draughts, getting wet, and the like. Catarrhal inflammation, commencing in the pharynx, not unfrequently extends to the nose, although the opposite course, viz., extension from the nose to the pharynx, is more frequent. The inhalation of certain irritating vapours, such as chlorine or iodine, or of certain powders, as that of ipecacuanha, may excite attacks of rhinitis. The effects of the internal administration of iodide of potassium, in producing symptoms of acute rhinitis, are familiar.

Rhinitis is symptomatic of certain diseases, such as influenza, measles, small-pox, and scarlet fever. It occurs

epidemically, under certain special conditions which are not understood. Its contagiousness has been asserted and denied by various authorities. Clinical facts, such as the tendency to attack, successively, several members of a household, point to its being contagious, although Friedreich's attempts to inoculate himself, by taking the secretions from cases of coryza, and applying them to his own nasal mucous membrane, were attended with negative results.

Catarrhal inflammation of the nasal mucous membrane generally affects both nasal cavities. The inflammation may be confined to these cavities, or may simultaneously involve the naso-pharynx. It often involves the mucous membrane of the maxillary and the frontal sinuses, and even of the sphenoidal sinus. The lachrymal duct and conjunctiva, and the lining membrane of the Eustachian tube, may participate in the inflammation. In the early stage the mucous membrane is congested and swollen. The arterio-venous network of the nasal membrane is peculiarly susceptible of rapid distension, especially over the lower turbinate bodies. To the congestive swelling serous exudation soon succeeds, and a watery discharge takes place. The secretion, at first serous, gradually assumes a mucous, and then a muco-purulent character, the swelling meantime subsiding.

Symptoms.—In the idiopathic form, as distinguished from cases arising from such causes as irritating vapours, drugs, &c., there is generally a short period of malaise, lasting a few hours, or a day or two, preceding the local symptoms. There may be headache, chills, and elevation of temperature to 100° or 101° . A little pyrexia may continue until the second or third day of the attack.

The first local symptom is a sensation of dryness and irritation in the nose, and very soon the nose gets stuffy from swelling of the mucous membrane, and the patient experiences more or less fulness or throbbing pain in the forehead. Within a few hours, usually, from the onset of

local symptoms, a watery discharge from the nose occurs. The occlusion of the nasal passages may now be complete, and the voice is correspondingly altered, and the senses of taste and smell are blunted. The gravitation of blood and serum may cause one or other nostril to be the more obstructed. Thus, in lying down in bed, the undermost nostril will generally be stopped. Attacks of sneezing are common in the dry stage, and at the onset of the watery discharge. The discharge, containing the saline constituents of the blood, irritates the skin about the orifices of the nostrils and the upper lip, and these parts soon become red and inflamed, from the irritation of the discharge, and the constant friction of the pocket-handkerchief. After a period, varying from a few hours to one or two days, the discharge becomes thicker and less irritating, and the smarting and fulness of the nose subside. The discharge gradually becomes muco-purulent, of a yellow or greenish colour, and scantier in quantity. The swelling of the mucous membrane has in the meanwhile gradually subsided, and the secretion, and any crusts that may form, are easily removed by blowing the nose. Rarely the discharge becomes quite purulent, and occasionally crusts form in the passages, difficult to expel, and with a tendency to undergo fetid decomposition.

If, as often happens, catarrhal inflammation extends to the neighbouring parts, the symptoms will be aggravated in various ways. The invasion of the antrum of Highmore causes aching pain in the cheeks and teeth, and marked increase of headache, frontal or general, may indicate extension to the frontal or other sinuses. The mucous membrane of the pharyngeal vault is more or less inflamed, in most cases. This may give rise to sensations of dryness and burning in the throat, of faucial irritation and hawking of phlegm. Singing in the ears, deafness, and earache, result from catarrh about the Eustachian orifice. Extension to the conjunctiva, the lower pharynx, the larynx, or bronchi,

causes the usual symptoms referable to those parts. The lymphatic glands beneath, and behind the sterno-mastoid, are sometimes swollen during an attack of nasal catarrh, and in certain individuals the swelling of the glands may outlast the catarrh.

On inspection, through the anterior nares, in the early stage, the mucous membrane appears red, somewhat dry and glazed, and swollen. The swelling is most marked on the inferior turbinate body, and it may be such as to block the inferior meatus, and completely obstruct the view of the passage. A little later, the swollen tissues are seen bathed in watery secretion. At a still later stage the secretion is of a yellower colour and of a viscid character, and the mucous membrane, still red and inflamed, is somewhat less swollen than at first. Posterior rhinoscopy shows the choanæ more or less completely blocked by the swollen middle and lower turbinate bodies. The mucous membrane of the vault of the pharynx is usually reddened and swollen, and covered with yellowish viscid secretion.

The duration of an attack of acute rhinitis ranges, usually, between four and nine days. On the other hand, many cases terminate abruptly on the second day, or even earlier, after a free watery discharge is established. This is the course usually followed by attacks due to local irritants. Acute rhinitis usually terminates in recovery, but it may pass into a subacute, or chronic form. It is, however, from a succession of acute attacks, rather than as a sequel to a single attack, that chronic rhinitis is apt to arise.

It is here important to remark that transitory attacks of sneezing, nasal obstruction, and watery discharge, are peculiarly common in certain individuals, and though usually referred to as "colds in the head," are not strictly attacks of acute rhinitis. They are distinguished by their usually sudden onset, and equally sudden subsidence. The attacks have often a very short duration, a few hours or less. If of

long duration, there are, usually, frequent remissions and exacerbations. There is an absence of constitutional symptoms, and of the definite stages, and gradual resolution of acute rhinitis. These attacks will be referred to more fully later on, under the name of *nervous coryza*.

Acute rhinitis in young infants may give rise to serious trouble. The meatuses are relatively smaller in infants, and the passages are therefore more readily obstructed. There will in consequence be inability to suck, owing to the necessity of breathing through the mouth. Great difficulty in breathing, and severe suffocative attacks, may arise during sleep, as the infant naturally tends to sleep with the mouth shut, or, even if the mouth be open, the tongue is apt to fall back in contact with the palate. It must be borne in mind that rhinitis in newly-born children, if at all persistent, is strongly suggestive of inherited syphilis.

Acute Purulent Rhinitis, in which the secretion is purulent almost from the commencement, is sometimes met with. It rarely occurs as a separate disease, but is more commonly an accompaniment, or sequel, of acute infectious diseases, such as scarlet fever, diphtheria, or small-pox. A very severe purulent rhinitis is occasionally, though very rarely, met with, the result of gonorrhœal infection. It may occur in the new-born infant, through infection from the vaginal secretion in delivery, and in the adult from direct conveyance of the poison by the finger, or handkerchief. Although undoubted cases have been recorded, both in the infant and the adult, it must be admitted that gonorrhœal rhinitis is of extreme rarity, compared with gonorrhœal conjunctivitis, the nasal mucous membrane being, evidently, but very slightly susceptible of the infection.

Treatment.—Prophylactic treatment includes the avoidance of the known causes of the malady, the wearing of suitable clothing, and the equable distribution of the clothing over the body, the latter being a point often neglected,

especially in children. A daily cold bath, if well borne, is held to be an effectual preventive against catching cold. Probably, however, the most important thing, in the case of persons who are the subjects of frequently repeated attacks of acute rhinitis, is to inquire into the state of the nasal passages, and to treat the very constantly present hypertrophic rhinitis.

An attack of acute rhinitis may sometimes be arrested at the onset. Many remedies are vaunted for this abortive treatment. All of these fail at times, and in any case the success depends much on the promptness with which the remedy is applied. Five or six drops of laudanum, five to ten drops of spirits of camphor, five to fifteen grains of quinine, ten grains of iodide of potassium, are some of the remedies relied upon. Any one of these may be taken at bedtime, the first night after the appearance of the symptoms, and its efficiency is insured by a hot mustard foot-bath, and a hot drink. Cohen claims to be able to arrest an attack by the administration of chloroform to complete anæsthesia, but this is obviously too dangerous a remedy.

Whether it is possible to completely arrest the attack at its onset or not, there is no doubt but that the severity and duration of an acute nasal catarrh can be much mitigated by treatment. The feverish condition at the onset is usually relieved by drop doses of tincture of aconite taken hourly. Free diaphoresis in the early stage is most useful. For this purpose a dose of Dover's powder (gr. v to x) may be administered at bedtime on the first night or two. This may with advantage be combined with James's powder, or the pulvis antimonialis of the pharmacopœia (gr. ii to v). Hot drinks, mustard foot-baths, and extra bedclothes will aid the effect. If this plan be adopted, the patient should generally be kept to the house, and a mixture, containing acetate of ammonia and spiritus ætheris nitrosi, may be administered during the day. The best effect will be

produced if the patient can be kept in bed the first day or two.

Turkish baths constitute the favourite mode of diaphoresis with some, and they undoubtedly benefit a cold. A warm air-bath may be extemporized in the patient's own bed-room by burning a large spirit lamp under a chair, on which the patient sits, enveloped in a blanket from the neck to the ground. Such a hot air-bath will set up copious perspiration, which continues after going into bed, and should be encouraged by free draughts of liquid. This treatment will sometimes completely arrest a cold in the early stage.

Sulphate of atropia gr. $\frac{1}{120}$ - $\frac{1}{60}$, three times a day, is said to shorten and mitigate a cold in the head. If there is much smarting and burning of the eyes and nose, the administration, at frequent short intervals, of a very small dose of arsenic, such as sixth of a minim of the liquor arsenicalis, every hour, will often give decided relief.

The inhalation through the nose of the vapours of ammonia and carbolic acid is useful for relieving the discomforts in the earlier stages, and is said to cut short the attack. The popular remedy, "Alkaram," is composed of these ingredients, and so is the German remedy of Hager and Brand (formula 18). Five or ten drops of the latter may be poured on to a funnel of blotting-paper, and inhaled every two hours. The inhalation of the vapour of iodine is recommended in the stuffy stage, but I have known this remedy to seriously aggravate the discomfort.

The application of a spray consisting of a four per cent. solution of hydrochlorate of cocaine, will generally relieve the obstruction of the earlier stages. Its effect is often very transitory, but in some cases the relief will last for five or six hours, and by repeating the application every four hours or so, constant relief may be maintained. Snuffing up a powder containing cocaine (formula 8) gives relief, but the

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effect is not so great as that of the cocaine spray. A powder containing a little morphia, one grain in half an ounce of gum acacia, is useful. A good combination is that recommended by Ferrier, containing bismuth and morphia (formula 7). This powder may be advantageously preceded by the cocaine spray, which will relieve the obstruction, and enable the powder to be more effectually applied. The nostrils should be kept coated constantly with the powder, fresh powder being snuffed up, or insufflated, each time the nose is cleared. Another useful snuff is that recommended by Moure, containing morphia, cocaine, camphor, and bismuth (formula 9).

If the muco-purulent stage be at all prolonged, a spray containing some astringent (formula 6), applied twice a day, will sometimes aid in establishing complete resolution, and in preventing a chronic catarrh from being developed.

In the severe **purulent** forms of nasal catarrh, a tepid alkaline spray (formulæ 1, 2, 3) should be used frequently, to cleanse the parts in the earlier stages. As the severity abates, the cleansing will need to be done less frequently, and may be followed each time by a mild astringent spray, or the insufflation of iodoform, boric acid, or an astringent powder (formulæ 10, 11).

The coryza of **infants**, especially the purulent forms, will often require careful local treatment. This is most conveniently carried out by frequently cleansing the cavities with a camel's-hair brush, dipped in some alkaline lotion, and subsequent insufflation of powders. If the passages are much blocked with purulent secretion, or crusts, it may be necessary to use a syringe, with some tepid alkaline lotion. The fluid should not be syringed into the nose with any great force, and it is best to use a syringe, with a sufficiently small nozzle, to allow the fluid to flow back again.

VII.

CHRONIC RHINITIS (Chronic Nasal Catarrh).

UNDER the term chronic rhinitis, or chronic nasal catarrh, are included long-continued inflammatory or hyperæmic conditions of the nasal mucous membrane, attended with alteration in the quality and quantity of the secretion, and often complicated with hyperplastic changes in the nasal mucous membrane.

Causation and Morbid Changes.—Chronic rhinitis may arise as the evident result of an acute attack. The catarrh accompanying the infectious maladies, such as measles, scarlet fever, small-pox, etc., is apt to pass into a chronic condition. More often it results from repeated acute attacks, especially if these are neglected. Chronic rhinitis may develop from any of the causes which produce acute attacks, without any specially marked acute stage, and often enough it develops without recognizable cause. Prolonged inhalation of dusty atmosphere is said to be a common cause. Hence persons employed in certain occupations, such as weavers, millers, stonemasons, and workers in tobacco factories are liable to suffer. Workers in arsenic and chrome factories are subject to a very troublesome form of chronic rhinitis.

Abnormalities in the nasal passages, such as deflections, or outgrowths from the septum, which obstruct the current of air, and impede the removal of secretions, strongly tend, more than any other cause, to the development of chronic

rhinitis. Diseased conditions in the naso-pharynx, especially adenoid vegetations, are a common cause of the complaint. Adenoid vegetations act partly by impeding the current of air, and partly by interfering with the easy return of venous blood from the nasal passages. New growths, foreign bodies, and destructive diseases in the nasal cavities, are causes of secondary catarrh in their vicinity.

It is generally acknowledged that heredity has much influence in producing a tendency to chronic rhinitis. The strumous diathesis plays an important part, and hence, although chronic rhinitis may commence at any age, the majority of cases date back from childhood. Syphilis, inherited or acquired, undoubtedly predisposes to the complaint. Spirit-drinking and snuff-taking are also predisposing causes.

In relation to the morbid changes in the mucous membrane, two forms of chronic rhinitis are usually described, viz., **simple chronic rhinitis**, and **hypertrophic rhinitis**. No very distinct line can, however, be drawn between the two, the latter being undoubtedly a later stage of the disease. The tendency to pass into the hypertrophic condition varies very much in different individuals. In some cases, especially in young persons of a strumous tendency, the process may make considerable progress in a short time, perhaps in a few months. In the majority of cases, some years must elapse before marked hypertrophic changes will be seen.

In the earlier stage of chronic rhinitis, the condition of the mucous membrane is one of hyperæmia, with increased secretion. There is generally diffused swelling, the mucous membrane presenting a red and more or less uniform, soft, velvety surface. The swelling is usually most marked on the inferior turbinate body, owing to a constant distension of the erectile tissue. The erectile tissue on the inferior turbinate body may, indeed, undergo considerable enlargement, whether due to an actual hypertrophy, or simply to

excessive dilatation of the venous spaces, is perhaps doubtful. This leads to the formation of large vascular swellings on the anterior or posterior ends of the inferior turbinate body, much larger than result from transitory swelling of the erectile tissue in its normal condition.

In course of time overgrowth of the tissues of the membrane takes place. The membrane may become thickened at various parts from an increase in all its normal constituents. The epithelial elements, the connective tissue, the blood-vessels, and the glandular elements, may all be increased. This hyperplasia leads to changes which are usually most marked on the inferior turbinate body, especially at its anterior and posterior ends. Thus the anterior end of the inferior turbinate body may form a large rounded tumour, sometimes smooth, more often uneven, nodulated, or divided into leaf-like segments. Sometimes pedunculated polypoidal excrescences are situated on the anterior end of the body. The whole extent of the inferior turbinate may be enlarged, presenting usually an uneven wavy surface, and a firm consistence due to the increase of connective tissue. The posterior end of the inferior turbinate may form a large rounded tumour with an irregular or lobulated contour, and large enough to completely obstruct the lower half of the choana.

The middle turbinate body is often affected in a marked manner, though less constantly than the inferior. The anterior border, and fore part of the inferior border, are chiefly enlarged. The swelling of this body may be so great as to completely fill the middle meatus, and press against the septum. The surface is usually red, and may be smooth, nodular, or granular. All the elements of the body, the mucous membrane, periosteum, and bone may be involved. These inflammatory changes in the middle turbinate have a special interest, as this body is the most frequent seat of mucous polypi, and it seems that these latter have a great

tendency to develop as the result of chronic inflammatory processes.

The mucous membrane of the septum often presents circumscribed or diffuse thickenings, the most frequent site being the lower part. Many cases of hypertrophic rhinitis are associated with marked septal deviation. In such cases it will often happen that the more capacious passage becomes gradually narrowed by overgrowth of the tissues on the middle and inferior turbinate bodies.

It is often stated that atrophic rhinitis is the final stage of chronic hypertrophic rhinitis. It is true that in course of time the hypertrophied tissues in chronic rhinitis do undergo a certain amount of shrinking, due, no doubt, to contraction of the newly-formed connective tissue. In this process the glandular elements may become involved, and partially destroyed. Dryness of the mucous membrane ensues, and some tendency to crust formation. I do not, however, believe the disease termed atrophic rhinitis, or simple ozæna, is to be regarded as the final stage of hypertrophic rhinitis, or that there is any sufficient proof that true atrophic rhinitis is necessarily or usually preceded by a hypertrophic stage.

Symptoms and Course.—Alterations in the quantity and quality of the secretion of the nose is the most constant accompaniment of chronic rhinitis. In health, the mucous membrane of the nose secretes chiefly a watery fluid, which goes to saturate the air as it is inspired. Only a very moderate amount of mucus is discharged from the anterior or posterior nares. In chronic rhinitis the amount of secretion varies in quantity and quality in different cases, and in the same case at different times. It is discharged chiefly from the anterior nares into the pocket-handkerchief, and partly into the naso-pharynx. It is sometimes thin and watery, sometimes it is a thick tenacious mucus, or this may alternate with the more watery discharge. It may be muco-

purulent, or even purulent. Chronic purulent rhinitis is mostly observed in children, especially in those of a strumous tendency. If the secretion be discharged in any quantity into the naso-pharynx, or if, as is often the case, this region be simultaneously affected with chronic catarrh, there will be frequent efforts to remove the discharge by hawking and spitting.

Sometimes the secretion dries and forms crusts on the fore part of the turbinate bodies and septum. Such crusts may occasionally acquire an offensive odour. The irritation caused by small crusts on the fore part of the septum often gives rise to a habit of picking the nose, and abrasion or ulceration of the surface at this point may result. Hæmorrhage often occurs from picking off the scabs from the ulcers, and perforation of the septum may take place from extension of the ulcerative process.

In the earlier and simpler form of chronic rhinitis there will be a more or less constant feeling of stuffiness, but no very marked nasal obstruction. Temporary obstruction, however, frequently occurs from distension of the cavernous tissue, and in lying down it will often be noticed that the undermost nostril is obstructed. In proportion to the amount of hyperplastic thickening, nasal obstruction becomes a more marked and constant symptom. Alteration in the voice, mouth-breathing, and various troubles dependent on nasal obstruction, arise. The sense of smell is impaired, and to some extent the sense of taste. The functions of the Eustachian tube are interfered with, and deafness, singing in the ears, and perhaps inflammation of the middle ear, may occur. The tear duct is sometimes obstructed. Dryness of the throat is often complained of, especially after sleep. The lower pharynx and larynx are liable to inflammatory troubles, from extension of the catarrhal process, and from the pernicious effects of mouth-breathing. The patients often complain of frontal head-

ache, a feeling of pressure in the head, inaptitude for work, and loss of memory. A sensation of pain or weight across the bridge of the nose is sometimes complained of, and this symptom is especially found associated with hypertrophy of the middle turbinate body, on one or both sides.

The swelling of the mucous membrane being liable to variations, the amount of obstruction varies at different times, and it is liable to be increased in damp weather. Very slight turgescence, also, of the erectile tissue will complete the obstruction in the already narrowed passage, and the swollen body, pressing on the septum, causes irritation, and keeps up the tendency to swelling. It must be remembered, also, that the subjects of chronic nasal catarrh are very liable to acute, or subacute attacks, in which most of their symptoms will be intensified.

Redness of the tip of the nose, often of a transient, recurrent character, may be noticed in connection with chronic nasal catarrh. Sometimes the integuments of the alæ and tip of the nose become permanently swollen and thickened.

In addition to the symptoms already enumerated, many conditions referred to in the section on "Reflex Nasal Neuroses," such as paroxysmal sneezing, spasmodic cough, asthma, etc., may occur in association with chronic rhinitis.

On examination with the nasal speculum, in simple cases, before hypertrophic changes have taken place, the mucous membrane will be found diffusely, but slightly, swollen, reddened, soft and velvety, and flecked here and there with secretion. It often bleeds easily when touched. The anterior end of the inferior turbinate body may be found so swollen as to be in contact with the septum. This swelling, which is smooth and uniform, of a red or pale grey colour, can be proved to be due to simple turgescence of the vessels by its easy indentation with the probe, and its sub-

sidence under cocaine. In some cases of chronic rhinitis, especially where there is a free watery discharge, the surface of the mucous membrane is somewhat pale throughout.

If the hypertrophic process has advanced to any extent, the changes will usually be most marked on the inferior turbinate body. The surface of the body will generally present an irregular wavy or knotty appearance, and it is with difficulty indented with the probe. In marked cases the anterior end of the inferior turbinate body will completely block the inferior meatus, and press on the septum. The surface of this swelling is usually uneven or raspberry-like, and of a red or greyish-red colour. The probe may be needed to make out the nature and attachments of the swelling, which, by the inexperienced, may be taken for a polypus. If the anterior end be not too much enlarged to permit a view, the middle and hinder portions of the inferior turbinate body may be seen thickened, to a greater or less extent, the inner surface approaching or touching the septum, and the inferior border projecting down and resting on the floor of the nose. If the posterior part of the inferior turbinate body be the principal seat of enlargement, this swelling may be seen sometimes from the front, blocking the hinder portion of the cavity, but it will be better seen by posterior rhinoscopy.

The middle turbinate body will often be seen swollen at its anterior and lower part. The colour will usually be redder than natural. Processes of hypertrophied tissue are not uncommonly seen projecting from its anterior and inferior border, freely movable with a probe. In some cases the middle turbinate body may form a large swelling, occupying the whole space between the septum and the external wall, projecting down to the inferior turbinate body, and thus completely occluding the middle meatus. The surface of the swollen body may be smooth, or may present

one or more rounded elevations of a redder colour than the rest of the body. Sometimes the surface, for a greater or less extent, may present the appearance of a mass of granulation tissue. Occasionally a vertical cleft may be perceived on the anterior aspect (*Woakes*).

The tissues of the septum may be seen to be more or less thickened, very often markedly so, near the floor, opposite the anterior end of the inferior turbinate body. Irregular elevations of the mucous membrane on the anterior part of the floor of the nose are not uncommon.

The surface of the mucous membrane is generally moist, and more or less secretion is present. In cases of long standing the swollen tissues may have a more or less dry appearance, and a dried film of mucus, or dry adherent flakes or crusts, are seen on the surface, more especially on the fore part of the middle turbinate body.

With the rhinoscopic mirror, the posterior end of the middle and inferior turbinate bodies, especially the latter, may be seen to be enlarged. The posterior ends of the inferior turbinate bodies sometimes form large rounded tumours, blocking up the lower half or two-thirds of the choanæ. These tumours are generally of a pale colour, but sometimes they are dark-red or purplish. They mostly present an uneven, nodulated surface, and may project into the naso-pharynx, and if present on both sides, may meet each other in the middle line, so as to hide the lower part of the septum. Sometimes these swellings are largely composed of erectile tissue, and will then vary in size at different times, and diminish on the application of cocaine. Thickening of the lower and back part of the septum will sometimes be noticed by posterior rhinoscopic examination.

The mucous membrane of the vault of the pharynx may often be seen congested, and there may be swelling of the pharyngeal tonsil, especially in children. Tenacious mucopurulent secretion may be present on the walls of the naso-

pharynx, and often some secretion will be noticed flowing from the posterior nares. The posterior wall of the pharynx may present a dry appearance, being coated over with a film of dried mucus. This appearance often coincides with the dry condition of the nasal mucous membrane, already referred to.

Hypertrophic rhinitis is generally bilateral, but by no means always symmetrical on the two sides. The course of the complaint is always very chronic. It may continue at any one stage of development for an indefinite term. The higher degrees of hypertrophy probably take a long time, perhaps years, to develop; and hence these higher grades are not very frequently met with in children. If the disease has existed for a long time, and the hyperplastic changes are far advanced, it shows little or no tendency to spontaneous cure. With suitable treatment, however, the prognosis is favourable as far as the relief of troublesome symptoms is concerned.

Treatment.—Persons affected with chronic rhinitis must avoid all influences tending to aggravate the malady, especially must they avoid catching cold, as each acute attack aggravates the chronic condition. Dusty atmosphere, and rooms or railway carriages laden with tobacco smoke, must be avoided. Snuff-taking should be prohibited, and alcohol taken but sparingly. Violent blowing of the nose is injurious, as is also the habit of constantly endeavouring to overcome the obstruction by forcible sniffing. A dry, pure, moderately warm atmosphere is the most favourable. Constitutional treatment with cod-liver oil, iron, sea-air, etc., may be advisable, especially in scrofulous children.

The treatment of the disease is almost entirely local, and is directed to three main objects, viz., the removal of morbid secretions from the passages, the restoration of the mucous membrane to its healthy condition, and the removal of obstruction to nasal respiration, and to the free drainage of

secretions. It is hardly necessary to say that before setting about the treatment we must be satisfied that there is no diseased condition present, such as adenoid vegetations in the naso-pharynx, nasal polypi, or a foreign body to which the nasal catarrh is merely secondary. Some cases of chronic nasal catarrh, especially such as have existed for a short time, yield readily to treatment; other cases are extremely obstinate, and tax the patience of both doctor and patient to the utmost, and in some of these, relief of the more troublesome symptoms is all that can be fairly hoped for. Care must be especially taken that we do not aggravate the patient's condition instead of benefiting it. It is impossible in chronic nasal catarrh to prescribe a remedy, and leave the rest to the patient. The sensitiveness of the nasal mucous membrane, and its reaction to remedies, vary much in different individuals. The effect of the remedy must be noted, and the mode of application must, at first, be carefully directed by the medical attendant. An intelligent patient is a great assistance in carrying out the treatment.

The cleansing of the passages is usually best accomplished by means of a tepid alkaline lotion, such as the compound alkaline wash (formula 2), applied with a spray apparatus. The nasal douche may be used with the precautions mentioned at page 47, or a syringe may be employed. The most troublesome cases to thoroughly cleanse are those in which the naso-pharynx is involved, and is coated with thick tenacious secretion. In some cases of chronic rhinitis the simple systematic cleansing, once or twice a day, with an alkaline wash produces marked improvement, or complete cure.

In other cases the cleansing may be followed by some alterative or astringent remedy, although it must be confessed that the efficacy of astringents on nasal catarrh is not great. The remedy may be applied in the form of spray or powder, and it is not always easy to say which will suit

best. On the whole, powders are to be avoided, except in cases where hypertrophic changes have little advanced, and where the secretions are rather thin and easily removable. It is therefore generally in the earlier stages that they will be found useful. Powders may be used as a snuff, or better, blown in with an insufflator once or twice a day after the parts have been cleansed. Powders containing tannic acid, bismuth, salicylic acid, or eucalyptus, have been found useful (formulæ 10, 11, 12, 13, 14). Bresgen recommends insufflation of nitrate of silver in mild cases of chronic rhinitis. He advises beginning with a strength of two grains of nitrate of silver to the ounce of starch, and gradually increasing the strength to forty grains to the ounce. As the application is apt to cause some irritation, it is best made to one nostril only, on each occasion. If a spray is used, a solution of tannic acid gr. v to ʒi, alum gr. ii-iv to ʒi, or sulphate or sulpho-carbolate of zinc gr. ii-iv to ʒi, may be applied after cleansing the passages. Astringents in the form of gelato-glycerine bougies, which dissolve slowly in the nasal passages, are sometimes useful.

Dr. Rumbold, of St. Louis, U.S., recommends a spray of warm vaseline for the treatment of nasal catarrh. It is effectual in cleansing the passages, and is less irritating to many persons than watery solutions. I have used the preparation of liquid vaseline, known as *Oleum Deelinæ*, in some cases, and have found it useful. After spraying the passages with liquid vaseline, the patient gently blows his nose to remove the secretions, and then makes a slighter application, so as to leave a thin film of the oil on the surface. The application is renewed every twelve to twenty-four hours, and then at longer intervals. An addition of five minims of eucalyptol, to the ounce, is sometimes advantageous, more especially if there is any tendency to decomposition of the secretions.

In slighter forms of chronic rhinitis with moderate

thickening of the mucous membrane, the above remedies, used with judgment, and varied according to the nature of the case, and its reaction to treatment, will be found sufficient. When, however, there is any considerable hypertrophy, some method of destroying the tissue, and restoring the free patency of the passages, will have to be had recourse to. Chromic acid, nitric acid, and glacial acetic acid are all useful for the purpose, but I think chromic acid is the best. A probe, slightly flattened at one end, serves very well for applying chromic acid. I always apply the pure acid, carrying a crystal or two of the deliquescent acid adhering to the end of the probe to the exact spot to be acted on. It is not well to do too large a surface at one sitting. The application is sometimes, though by no means always, somewhat painful; but painting the part with a solution of cocaine before applying this, or other destructive agent, considerably lessens the pain. After the application it is well to wash the parts with an alkaline lotion. Chromic acid is very effectual for reducing the cavernous swellings on the inferior turbinate body. Bosworth thinks the formation of a thin slough over the cavernous tissue when it is constricted by the previous application of cocaine, acts by buttoning down the tissues for a time, and so allowing the walls of the vessels to regain their normal tone.

We have in the galvano-cautery a very effectual means of treating the redundant tissue. Its use is generally less painful than chemical caustics. Occasionally, however, it is followed by rather violent inflammatory reaction, and it is therefore well to be cautious about using it too freely at any one sitting. It is also a good rule not to apply it to both nasal passages at the same sitting. In treating the swelling on the anterior ends of the inferior turbinate bodies, the flat, spatula-like point, at a red heat, may be drawn from behind forward across the swelling, so as to score it deeply. Two or more such furrows may be made, one below the

other. Good results are obtained on the cavernous tissue by sticking a pointed cautery deeply into the tissue, at several points, or by inserting it at one point, and moving it about freely in the deeper parts, while at a red heat. For this latter method it is claimed, as an advantage, that there is less destruction of the epithelial and glandular structures at the surface.

When the hypertrophied tissue is very excessive, the loop of the galvano-cautery snare may be passed round it so as to amputate a portion. It may be necessary to transfix the tissue with a needle so as to make the loop hold. As a rule, however, this latter will be accomplished by heating the wire, as soon as it is in contact with the surface, and then tightening. In this way the wire tends to adhere. Hypertrophies of various kinds, affecting the inferior, or middle turbinate bodies, can be treated with the flat galvano-cautery points, or with the galvano-cautery snare, according to the nature of the case.

The enlargements of the posterior ends of the inferior turbinate bodies are the most difficult to treat. Sometimes the application of the galvano-cautery point, through the anterior nares, or with the rhinoscopic mirror through the naso-pharynx, will be effectual. Tying the palate forwards will facilitate the latter proceeding. The galvano-cautery loop may also be applied to these overgrowths, through the anterior nares. When the overgrowth is very great, Jarvis's wire *écraseur* (Fig. 26) is probably the most handy and effectual instrument for dealing with it. This is a light and powerful *écraseur*, and can be passed through a narrow nostril. A tube, slightly curved at the distant extremity (Fig. 26, A) can be used instead of the straight tube, so as to afford greater facilities for adjusting the loop. When the loop has been adjusted over the growth, the cutting through should be done very slowly, to ensure freedom from hæmorrhage.

General hypertrophy of the middle or inferior turbinate

body, can be effectually remedied, in some cases, only by partial or complete removal of the bone. This operation can be performed, according to the circumstances of the case, by means of a galvano-cautery loop, Mackenzie's punch forceps, or some form of nasal scissors, or the bone may be

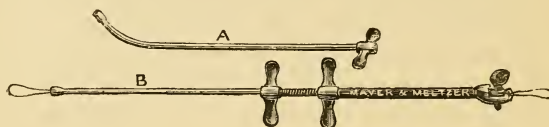


FIG. 26.—Jarvis's Wire Snare-écraseur.

broken up with a drill. An anæsthetic will often be necessary for this operation.

The correction of septal deviations and the removal of spurs and outgrowths from the septum, where these abnormalities interfere with the patency of the passages, are often an essential part of the treatment of chronic rhinitis.

VIII.

ACUTE NASO-PHARYNGEAL CATARRH

(Acute Naso-pharyngitis, Acute Post-nasal Catarrh).

ACUTE catarrhal inflammation is never wholly confined to the naso-pharynx, the nose, or lower pharynx being always simultaneously affected. The brunt of a catarrhal attack may, however, fall on this region. Acute rhinitis is always accompanied by more or less inflammation of the naso-pharynx. All the causes which give rise to acute rhinitis, such as cold, chills, direct irritants, etc., may lead to a similar condition in the naso-pharynx. In certain infectious diseases, such as measles, scarlet fever, and typhoid, the naso-pharynx is frequently inflamed.

The process is characterized by general redness and swelling of the mucous membrane. The follicular elements are swollen, giving rise to a coarsely granular appearance. The cushion of adenoid tissue constituting the pharyngeal tonsil is swollen to a greater or less degree. Sometimes the pharyngeal tonsil is the part principally inflamed, and white plugs may occasionally be discerned in the orifices of the crypts similar to those seen in the faucial tonsils. In such cases we have an acute follicular inflammation of the pharyngeal tonsil, analogous to the ordinary follicular tonsillitis in the faucial region.

The **symptoms** which indicate implication of the naso-pharynx in an acute catarrh, are soreness and a feeling of burning and dryness in the upper part of the throat. There

may also be pain in swallowing. The dryness, after a day or so, gives place to increased secretion, which is of a thick, viscid character, clear at first, and then more purulent. The removal of this secretion is effected by frequent inspiratory snorts and hawking efforts. Ear symptoms are common, such as deafness, tinnitus, and earache; and otorrhœa may also supervene. Impediment to nasal respiration may be present, with mouth-breathing, and altered sound of voice, the latter being especially marked in the pronunciation of the nasal consonants *m* and *n*.

Treatment.—No special treatment is needed in the early stages, apart from such general treatment as is found useful in other acute catarrhal affections. In a later stage a tepid alkaline lotion (formula 1 or 2), applied through the anterior nares, will be found useful in removing the secretion, if it cause much trouble. A post-nasal spray or syringe may be used if it is desired to avoid the nasal passages. Gargling the throat with the same lotion will help to remove the secretion which trickles down the pharyngeal wall. There is no doubt that catarrhal inflammation of the naso-pharynx tends in many cases to linger, and pass into a chronic form. This must be borne in mind, and some of the measures, recommended in the treatment of the chronic form, must be adopted, when the complaint shows such tendency.

IX.

CHRONIC NASO-PHARYNGEAL CATARRH
(Chronic Post-nasal Catarrh).

Causation and Nature.—Under the term chronic naso-pharyngeal, or post-nasal catarrh, are included conditions of chronic inflammation, congestion, or irritation of the mucous membrane of the naso-pharynx, attended with alterations in the quantity and quality of the secretions. It is usually associated with a similar affection of the nose, or lower pharynx, but the affection of the naso-pharynx is often the leading trouble. All the causes which lead to the production of chronic rhinitis, and chronic pharyngitis, are of import here. Many authors have attributed an especially baneful influence to the continued inhalation of air containing irritating admixtures, whether ordinary outdoor dust, or particles arising from certain kinds of work. This influence is due no doubt to the greater difficulty of removing such particles when they lodge in this region, than when lodged in the nose or lower pharynx.

Chronic naso-pharyngeal catarrh is developed, not unfrequently, from relapsing attacks of acute rhinitis, in which, as already stated, the naso-pharynx is frequently more or less implicated. It is sometimes a sequel of measles, scarlatina, and other infectious diseases, and it tends to occur in persons addicted to alcohol, and in scrofulous and tubercular subjects.

Many local causes give rise to the affection. Abnormali-

ties in the nasal passages, and nasal obstruction from any cause, may lead to it. Hypertrophy of the tonsil tissue in the vault of the pharynx, an affection common in children, is a frequent cause of more or less catarrh of this region. Tornwaldt* maintains that a considerable number of cases of post-nasal catarrh are entirely due to an affection localized in the **pharyngeal bursa**, and only yield to direct treatment of the bursa.

This structure, which, as already described (page 13), is situated behind Luschka's tonsil, opens by an orifice of varying size, in the median line, just below the tonsil, at a point midway between the posterior margin of the septum and the prominence of the arch of the atlas. The bursa is by no means constantly present. It seems most probable, according to the researches of Schwabach and others, that it is itself of pathological origin. In new-born infants, and young children, the pharyngeal tonsil consists of some six or eight prominent bands or ridges, having an antero-posterior direction, and arranged side by side, across the vault of the pharynx, with furrows or clefts between. As the tonsil develops, the indentations become deeper, especially the median cleft. Later on, owing to inflammatory processes which are common in this region, the ridges of tonsil tissue bounding the median cleft unite, and bridge over a hollow space, which often, through retention of secretions, lengthens and fills out, and is henceforth demonstrable as the pharyngeal bursa. Nevertheless, a bursa may be present without excessive secretion, or any retention thereof. The bursa in such case may be regarded as healthy.

The anatomical changes in chronic naso-pharyngeal catarrh are more or less congestion in the early stages, and later on, thickening and hypertrophy of the elements of the mucous membrane. The pharyngeal tonsil, and solitary

* "Ueber die Bedeutung der Bursa Pharyngea," etc. Wiesbaden, 1885.

scattered masses of adenoid tissue are enlarged to a greater or less degree. The mucous membrane over the Eustachian prominences, and in the fossa of Rosenmüller, becomes thickened. In long-standing cases the follicular and other elements of the mucous membrane may become atrophied, causing the membrane to assume a thin, smooth, and polished appearance.

Disease of the pharyngeal bursa usually consists of hypersecretion from the mucous lining, attended with a discharge of muco-purulent, or purulent, secretion from the orifice. Occasionally, owing to occlusion of the orifice, or of a communication between the bursa and a diverticulum leading from it, the secretion collects, and a cyst is formed.

Symptoms.—The symptoms of chronic post-nasal catarrh are chiefly due to the trouble caused by the secretion. This secretion, mostly of a greyish colour, is usually not large in quantity, but is exceedingly tenacious and viscid, and adheres to the mucous membrane. For this reason, and also because of its situation, it is difficult to expel. Sometimes it is abundant, and may then collect in a large mass in the naso-pharynx. Such large masses, however, may proceed from the posterior nares. Sometimes the secretion is of a purulent character, and it may have a tendency to dry in crusts.

The patients usually complain of an uneasy sensation in the upper part of the throat, or of dryness in that region, or of a feeling of a foreign body there. They frequently endeavour to clear the throat by noisy nasal inspiratory jerks, and hawking efforts. They not unfrequently retch or vomit in the efforts to clear the throat, especially in the morning, when the discomfort is generally greatest.

Deafness and noises in the ears often arise in the course of the disease from affection of the Eustachian tubes, and imperfect ventilation of the tympanum. Dull headache and inaptitude for work are sometimes present in severe cases.

The coexistence of chronic nasal catarrh, and of chronic pharyngitis often complicates the case with symptoms referable to those complaints. Not unfrequently more or less chronic laryngitis is present, with consequent roughness of voice, or aphonia.

Exactly similar symptoms may be present in cases where the trouble is localized in the pharyngeal bursa; rhinoscopic examination alone enabling the diagnosis to be made.

Rhinoscopic examination, in chronic post-nasal catarrh, reveals some redness, usually not marked, some swelling of Luschka's tonsil, and often small red elevations on the posterior wall below this structure. Particular attention should be directed to any great hypertrophy of Luschka's tonsil, and to the condition of the orifice of the pharyngeal bursa. More or less of greyish or yellowish secretion will be seen adhering to the walls of the naso-pharynx, or dry adherent crusts may exist. Sometimes the surface is covered with a thin, varnish-like coating of dried mucus. In old cases the mucous membrane may present a smooth, thinned aspect from atrophic change and disappearance of the follicular elements, and the cavity of the naso-pharynx will in consequence be increased in capacity.

Where the catarrh is localized in the pharyngeal bursa, the orifice of the bursa may be seen covered with an adherent mass of secretion. One may sometimes, on loosening this, be able to observe its connection with the bursa by a little thread of mucus, proceeding from its orifice. The secretion will often be seen running down the posterior wall of the pharynx, and may then be observed merely by the use of the tongue spatula. It will be noticed, however, that the upper part of the pharyngeal wall, between the bursal orifice and the choanæ, is free from secretion. Sometimes the secretion has a great tendency to dry, and may collect in hard adherent crusts on the posterior wall, or the back of the pharynx may present a dry, shiny appearance, being covered with a var-

nish-like layer of dried mucus. When, from retention of secretion, a cyst is present, it will present the appearance of a rounded, glistening swelling of a yellowish, or bluish colour, of the size of a small cherry-stone, or larger.

Treatment.—The removal as far as possible of all causative influences must be first thought of, and morbid conditions of the nose and lower pharynx should be treated concomitantly with the naso-pharynx. Tobacco and alcohol must be restricted, or altogether prohibited. Constitutional treatment may be indicated in scrofulous, anæmic, or syphilitic subjects.

The treatment of the disease is mainly local, and much patience will often be demanded to effect a cure. The removal of the secretion is the first thing to be done, and this is most easily effected by means of a tepid alkaline lotion (formulæ 1, 2). It may be applied with a syringe or douche, or generally best with a spray apparatus, through the anterior nares, the more so, as there is usually accompanying chronic rhinitis. The cleansing must be repeated once or twice daily, at first, and afterwards at longer intervals. The posterior nasal spray will sometimes be needed, and if there is any large amount of hard crusts, the posterior nasal syringe may have to be used at first.

Great benefit will usually be perceived from the cleansing treatment only, but to effect a cure it will be necessary, after cleansing the mucous membrane, to apply some stimulant or astringent remedy. Such remedy may be applied in solution, with the posterior nasal spray, or with a brush or cotton holder, or in the form of a powder insufflation. On the whole, the insufflation of powders has a more general application here than in the treatment of nasal catarrh.

For most cases, daily painting with a solution of nitrate of silver, gr. x to $\bar{3}$ i, gradually increasing the strength to gr. xl to $\bar{3}$ i, is very beneficial. Nitrate of silver may be used, also, as an insufflation, gr. $\frac{1}{10}$ to gr. $\frac{1}{2}$ in ten grains of

starch. Morell Mackenzie recommends insufflation of powdered eucalyptus gum (formula 14). Other astringents, such as were recommended in the treatment of chronic nasal catarrh, will be found useful, but the naso-pharynx will tolerate stronger medication than the nose. No application is of any use until the surface has been cleansed of its secretion. Insufflation can usually be performed by the patient himself.

In any case, treatment must be persisted in for many weeks before decided benefit can be obtained. The chief reason, however, why the symptoms of post-nasal catarrh are found so obstinate, and apparently uninfluenced by remedies, is, believe, in most cases, that the real cause is overlooked, and therefore not remedied. Some form of nasal obstruction, for instance, is often the real disease, and it is useless to treat the post-nasal symptoms, while this is left unrelieved.

The treatment of chronic bursal discharge consists partly in the removal of the secretions from the naso-pharynx, but mainly in direct applications to the bursa itself. The first indication may be fulfilled by one or other of the methods above referred to. For the bursa itself, the application of nitrate of silver is very beneficial. This may be applied in the form of a solution, gr. xx to ʒi, by injecting it through a suitably bent canula, with a small syringe, or, more easily, in the solid form, fused on the end of a bent probe. More effectual still is the introduction of a sharp galvano-cautery point into the bursa, raising it to a red heat when within. This may be repeated, at several sittings, if necessary. A more radical mode of treatment is sometimes advisable, especially when there is decided enlargement of the pharyngeal tonsil. This consists in removing the whole of the tonsil tissue by means of a curette or forceps, in the manner described in the section on Adenoid Vegetations. A cyst can be effectually treated by the flat cautery point thrust into it, so as to divide it across.

X.

FIBRINOUS RHINITIS (Croupous Rhinitis).

RHINITIS attended with the formation of membranous exudation, occurs, sometimes, quite independently of diphtheritic infection. Such cases have been described by Hartmann,* Moldenhauer,† Bischofswerder,‡ and others. They have been observed to occur sporadically. They exhibit no evidence of infectiousness, and run a favourable course. Nevertheless, the diagnosis of simple membranous rhinitis from diphtheria must be cautiously made, nor can the anatomical characters, which are supposed to distinguish a croupous from a diphtheritic membrane, be relied upon.

The complaint has been almost exclusively observed in children, and, according to Bischofswerder, more especially in scrofulous children. Nothing is definitely known as to the exciting cause.

The **symptoms** resemble those of ordinary acute rhinitis, except that they are more intense, and the nasal obstruction is more complete, and the duration of the attack is more prolonged. There is usually moderate fever at the onset. The secretion is at first thin and copious, often causing redness, erosion, or eczema of the nasal orifices, or upper lip. Later on, the discharge becomes muco-purulent, and then purulent, but not fetid. The nasal obstruction, which

* Deutsch. Med. Woch. 1887, No. 29.

† Monats. f. Ohrenheilk. 1887, No. 9.

‡ Archiv. f. Kinderheilk. 1889, B. 10, H.2.

has been gradually increasing, becomes complete after a few days.

On examination at the early stage there is redness and swelling of the mucous membrane, but, at the period of complete obstruction, a yellowish-white adherent membrane is found covering more or less of the septum, floor, and inferior turbinate body, and may sometimes extend to the middle turbinate. On removal of the membrane, the surface beneath is found inflamed and slightly bleeding. After removal, the membrane reforms again, in twenty-four to forty-eight hours, though less and less each time. If not removed, the membrane spontaneously separates after a variable number of days, when a simple rhinitis remains, which soon gets well. The duration varies from six or eight days to two or three weeks.

For **treatment**, it is recommended to remove the membranes as they form, and to wash out the nose two or three times a day with a tepid alkaline disinfecting lotion. After removal of the membrane, iodoform may be insufflated. Bosworth prefers to paint the surface, after removal of the membrane, with tincture of iron.

XI.

ATROPHIC RHINITIS (Chronic Fetid Rhinitis,
Simple Ozæna).

Causation and Morbid Changes.—The disease known as atrophic rhinitis is a chronic affection of the nasal passages, probably of inflammatory origin, characterized by a wasting of all the elements of the lining membrane, and to a variable extent of the subjacent bone also, and by an altered state of the secretion, of such a nature that it assumes a purulent character, and tends to crust formation, and to rapid fetid decomposition. From the fetor of the secretions, the name **ozæna** is also applied to the disease, and many authors now restrict the term ozæna to this particular malady.

The condition is probably always developed slowly, the process extending over some years, and of its precise etiology little is known. The disease is more common in females than in males, and it usually dates from childhood, or from about the age of puberty. It commences very rarely indeed in adult life. It is doubtful whether syphilis, inherited or acquired, and scrofula, are more than occasional predisposing causes. The subjects of the malady are, however, as a rule, not in robust health. They are often markedly anæmic. Dr. de Havilland Hall maintains that anæmia is an important etiological factor, and that the frequency of gastric ulcer, in the same kind of patients, points to a special vulnerability of the mucous membranes in anæmia. Atrophic rhinitis is said to develop sometimes as a sequel of acute illnesses, such as diphtheria, typhoid, measles, etc.

In an advanced case of atrophic rhinitis the mucous membrane is thin, wasted, and dry. The glands and erectile tissue have more or less completely disappeared, and the turbinate bones, especially the inferior, are of diminutive size. In some cases the inferior turbinate is represented merely by a thin fold of mucous membrane on the outer wall. The mucous membrane of the naso-pharynx is also almost invariably atrophied, and the adenoid tissue in the vault has almost quite disappeared.

It is held by many that the atrophic condition is preceded by a hypertrophic stage, and, in fact, that atrophic rhinitis is the final stage of chronic rhinitis. This view, however, depends rather on theoretical considerations than on actual clinical experience. It is not denied that atrophic rhinitis may occasionally be preceded by a hypertrophic state, but there is not the least proof that this is the usual sequence. We are, in fact, very much in the dark about the condition of the mucous membrane at the onset of the atrophic process. It is certain, however, that a simple purulent rhinitis precedes the atrophic and fetid stage, for a more or less prolonged period in some cases, and Bosworth maintains that purulent rhinitis in every case precedes atrophic rhinitis.

The epithelium of the glandular structures undergoes fatty degeneration early in the disease. The glands and bloodvessels are gradually destroyed and in great part disappear, and the mucous membrane is ultimately transformed into a thin layer of fibrous connective tissue. The delicate spongy bones also waste, as a natural consequence of their nutrition being affected by the atrophy of the mucous membrane and its bloodvessels. Owing to the destruction of the serous glands, whose function it is to keep the nasal mucus thin and watery, the mucus becomes scanty and tenacious, and adheres to the surface of the nasal cavities. It dries rapidly, and, undergoing decomposition, gives rise to the offensive odour which characterizes the disease. The secretion

under the firm crusts, being imprisoned, causes irritation and further pus secretion. Indeed, the extraordinary amount of crusts which sometimes are formed in a short time, notwithstanding the diminution of secreting glands, renders it obvious that the lining membrane acts the part, to a great extent, of a pyogenic membrane. It is probable, also, that the firm adherent crusts constrict the circulation, and favour further atrophy of the mucous membrane and spongy bones.

Zaufal holds that the diminutive size of the spongy bones is congenital. The abnormal width of the cavities, resulting therefrom, conduces to the drying and retention of the secretions, and the accumulation of secretions leads in turn to the subsequent atrophic changes in the mucous membrane. Against this, however, is the fact, that very marked atrophy of the bones is only met with in cases of long standing.

The exact origin of the fetor has been a subject of much discussion. It undoubtedly resides in the crusts and secretions, and is presumably owing to their decomposition. The rapidity with which fetor returns, after thoroughly cleansing the passages, is remarkable. Krause is of opinion that the fatty globules, in the degenerated epithelial cells, undergo rapid decomposition into fatty acids, and that hence arises the peculiar fetid odour. A special form of micrococcus has been described by Lœwenberg, as being found in the secretions, in cases of simple ozœna, and must be supposed to be connected with the decomposition.

The odour varies much in intensity in different cases, and is not always in proportion to the amount of retained crusts and secretions. One meets occasionally with cases presenting the unmistakable sickly odour of atrophic rhinitis, with more or less atrophy of the mucous membrane, and in which little or no crusts are visible. How far the ethmoidal or sphenoidal sinuses may be the chief seat of the decomposing secretions, in such cases, is uncertain.

Symptoms.—The symptoms may be very slight, or well marked, and depend in great measure on the extent to which inspissated crusts are present in the nasal passages. In any case, they will have supervened gradually and slowly, and, at the time the patient comes for treatment, they will probably date back for some years.

In most cases the patient has from time to time a feeling of something lodged in the nose, and when the nose is blown a lump of dried mucus is discharged. This may occur at intervals of a day or two, or longer, and the lumps vary in size, are of a greyish-green or brown colour, and smell offensively. Similar lumps are in some cases hawked up from the naso-pharynx. In more severe cases, quantities of inspissated muco-pus of a fetid character, and often mixed with blood, are discharged daily. Attacks of epistaxis are not uncommon, resulting from the mechanical irritation or forcible removal of the crusts. There are apt to be pain and irritability of the nose, and a constant desire to pick at it. Dryness and discomfort are complained of at the back of the nose and upper part of the throat. The crust accumulation may be sufficient to cause some nasal obstruction, but more often there is a feeling of stoppage, without any actual obstruction. Dull headache, pressure over the eyes, and incapacity for mental work may be present, as in many other nasal affections. The sense of smell is always interfered with, often quite abolished. Hearing is often impaired, and tinnitus complained of.

The intensely sickly, offensive, odour from the patient's breath is, however, the prominent characteristic symptom. The fetor is comparable to none other, and is quite peculiar to this disease. Yet, rarely, do the patients themselves perceive the odour: they, usually, are first made aware of it by those around them. For this symptom they often enough first present themselves for treatment, generally attributing it to their stomach or teeth. It is not uncommon for these

patients to suffer from more or less gastric catarrh, which may well be attributed to swallowing decomposing crusts from time to time. The prolonged inhalation of fetid air can, also, be easily believed to have an injurious effect on the general nutrition, and it is a question whether the anæmia, and mal-nutrition, which are often present in these patients, are not a result, rather than a determining cause, of the disease.

The external nose not unfrequently presents a peculiar conformation in atrophic rhinitis. It is more or less markedly flattened, of the so-called saddle-back shape. The anterior nares are large, and the plane of the nares looks more forward than natural (snub-nose).

Examining the interior of the nose from the front, in a well-marked case, the first thing that usually strikes us is the spacious, roomy character of the cavities. The mucous membrane presents a dry, glazed, pale, appearance, but is almost sure to be hidden, in greater or less part, by dried adherent flakes and crusts. Large greenish or brownish masses may be seen impacted in some part of the cavities, often at the vault. It will generally be necessary to cleanse the passages in order to make a thorough inspection. The mucous membrane will then present an unexpectedly healthy surface, congested at first from the effects of the washing, but afterwards paler than normal, without any sign of ulceration, or usually, even, of the most superficial erosion. It is obviously thin and shrivelled throughout, and nowhere, not even on the inferior turbinate, has it a soft, velvety feel to the probe. The turbinate bodies are reduced in size, and from the thinness of their covering their contours show up more sharply than natural. The inferior turbinate may have almost disappeared, so that the inferior and middle meatus form one cavity. In consequence of the width of the passage a portion of the posterior wall of the pharynx is easily seen from the front; and usually, the orifice of the Eustachian

tubes, as well as movements of the levator cushion, and of the salpingo-pharyngeal fold, can be well seen.

In marked cases, the naso-pharynx is always more or less involved. With the rhinoscopic mirror the surface will present a dry, glazed, atrophied appearance, being covered with a thin layer of dried mucus, while largish green or brown lumps may be seen about the vault of the naso-pharynx or in the choanæ. The naso-pharyngeal space will be more roomy than normal in consequence of the wasted condition of the mucous membrane, and especially of the adenoid tissue. Rosenmüller's fossa will appear deepened, and the Eustachian prominences stand out more sharply than usual.

The mucous membrane of the lower pharynx partakes more or less in the atrophic process. It has a dry, glazed, and polished appearance, being covered with a varnish-like coating of dried secretion. The soft palate is often thin, and the uvula slender and threadlike.

Hoarseness is a tolerably common symptom in patients suffering from atrophic rhinitis. This may be due to a simple catarrh of the larynx, to which these patients are subject, but in certain cases, dry adherent crusts may form in the larynx, about the vocal cords, in the subglottic region, and especially in the upper part of the trachea, where they can be detected with the laryngoscope. These crusts have the same fetid odour as those in the nasal passages. In these cases, therefore, complete removal of crusts from the nose will not entirely abolish the fetor of the breath. This complication has been described as **laryngo-tracheal ozæna**. There will usually be a good deal of cough, especially in the morning, in connection with this condition, and the crusts will be expectorated from time to time.

Atrophic rhinitis is usually present, and equally advanced, in both nasal cavities. It may, however, remain confined to one cavity for a long time, or be much more advanced in

one than the other. In some cases the disease affects principally, or entirely, the naso-pharynx.

The disease is essentially a chronic one, and where atrophy is well advanced, may be reckoned incurable. The ozæna, however, can be so thoroughly kept in abeyance that, though not cured, the disease can be relieved of its principal terrors. As age advances the fetid smell diminishes spontaneously, and it generally disappears between fifty and sixty years of age.

Treatment.—The subjects of atrophic rhinitis are frequently such as to suggest the advisability of a course of cod-liver oil, iron, or arsenic, and such constitutional treatment will be found a useful aid to the local treatment, which, however, is of paramount importance.

In atrophic rhinitis, if the passages be thoroughly cleansed of crusts and secretions, the offensive odour disappears for a time. It quickly returns, however, and the crusts soon re-form. If the crusts be removed daily, it will be found that, after a short time, the odour is longer in returning, and the crusts do not form so quickly or so abundantly.

We must first, therefore, direct our treatment to the thorough, and regular, removal of all secretions from the nasal cavities and naso-pharynx. This is not always an easy matter. The crusts are sometimes very hard and firmly impacted, and, in these troublesome cases, their removal should be undertaken in the early period of the treatment, as often as convenient, by the medical attendant. An alkaline, or alkaline disinfectant lotion (formulæ 1, 2, 3, 4), applied with a spray-apparatus, douche, or syringe, will mostly effect the purpose. It will, however, be often necessary, at first, to supplement the irrigation of the passages, by loosening and detaching the crusts with a brush, or, better still, with a probe dressed with cotton-wool.

The spray is in general the best method of washing out the nasal passages. An apparatus throwing a powerful

coarse spray, and fitted with a conical nozzle, used according to the directions at page 45, is the most effectual. The anterior or posterior nasal syringe is useful for dislodging crusts in the first instance. The douche is also an effectual method of cleansing the nasal passages, but, for the reasons already mentioned, it has fallen somewhat into disuse.

Although thorough cleansing will remove the odour without a disinfectant, it will in practice be found advantageous to select a wash containing some disinfectant. After cleansing the cavities, a little iodoform, or iodol, or powdered boric acid, may be insufflated with advantage.

After a time the crusts will no longer form so rapidly, and the patient, by cleansing the passages, once or twice a day, will be able to keep them clear of secretion and free from odour. Other cases are more obstinate, owing to a persistent tendency to rapid drying, and crust formation, in the passages. In these cases the application to the mucous membrane of some oily or fatty substance is very useful.

Vaseline, lard, gelato-glycerine, or some other simple ointment may be applied to the interior of the nose with a brush, or a probe dressed with cotton-wool. It is, however, better to diffuse, throughout the cavity, the oily matter in the form of a spray. For this purpose vaseline melted each time with heat, or one of the liquid vaseline preparations, is the best. After cleansing the passages in the manner previously described, the vaseline spray is used, the direction of the nozzle being variously altered, so as to reach all parts of the cavity. Five or ten minims of eucalyptol may be added to the ounce of liquid vaseline. The vaseline spray may be repeated frequently during the day, if necessary.

By the preceding method of treatment cases can be brought into a condition in which the use of a detergent spray daily, or even at longer intervals, will keep all the symptoms in abeyance. It is rare, however, for the patient to be able to dispense with such cleansing treatment for any

length of time, much less altogether. The question arises whether any application of a stimulant character can arrest the morbid process, or so alter the condition that something tantamount to a cure may be obtained.

There is no doubt that something can be done in this direction. Various applications of a stimulant character have been recommended as useful by different observers, and even if these do not produce any real curative effect, they stimulate the surface, and induce a more watery secretion, whereby the formation of crusts is retarded, or prevented. Morell Mackenzie has found the insufflation of powdered eucalyptus with starch (formula 14) very useful. Bosworth recommends sanguinaria and galanga (formula 16). Salicylic acid (formula 13) is also useful. Any of these powders may be insufflated, daily at first, and afterwards at longer intervals. Moldenhauer speaks well of the effect of finely-powdered aceto-tartrate of aluminium, insufflated once or twice a week. Ruault recommends painting the mucous membrane with camphorated naphthol, which is made by rubbing together, in a mortar, one part of naphthol and two of camphor. The application may prove painful, and it may be necessary to dilute the camphorated naphthol with one or two parts of vaseline. It has the advantage of being, not only stimulating, but also strongly antiseptic. Other stimulating and antiseptic applications which have been found beneficial are, glycerine of iodine, and creosote, the latter diluted with equal parts of glycerine. In some cases the stimulant applications may need to be applied directly to the mucous membrane of the naso-pharynx, as well as to that of the nose.

A very useful method of treatment is that introduced by Gottstein. This consists in the introduction of a firm tampon of cotton-wool into the nasal passages after cleansing. This method has been a good deal misunderstood, and misapplied. The anterior nares, alone, are sometimes plugged,

and medicated wools are used. It is laid down by some that the only object is to arrest the nasal current of air, and so prevent drying of secretions. The main object of the treatment, however, is to produce a more fluid, and more copious secretion, by stimulation of the surface with the tampon. For this purpose a tampon must be prepared, about the length and thickness of the little finger. This is introduced into the nasal passage, after thoroughly cleansing it, and when in the passage, it is pushed up with a probe as high as possible in the cavity, so as to leave the inferior meatus free. The tampon is best introduced by means of a screw devised by Gottstein for the purpose, but it may be inserted with a pair of light dissecting forceps. The tampon should be changed twice in twenty-four hours, and may be worn in both passages simultaneously, or one passage may be tamponed in the day, and the other in the night.

Cauterization of the surface of the mucous membrane, with the galvano-cautery, is highly spoken of by Harrison Allen, B. Fränkel, and others. It is recommended that small surfaces only should be done at each sitting, those parts being selected where crusts have been especially apt to form. Harrison Allen also recommends the galvano-cautery for removing hard crusts. He passes in a spiral-looped electrode against the crust, and states that, when heated, it so adheres as to enable the mass to be withdrawn with the greatest ease.

The existence of a complicating laryngo-tracheal or tracheal ozæna, although not of very frequent occurrence, should be thought of, especially if the breath remains fetid in spite of thorough cleansing of the nasal passages. The complaint, if present, is best treated by inhalation of a fine spray of some alkaline disinfecting fluid, used once or twice daily, and, after a time, less frequently.

XII.

OZÆNA.

OF late years, there has been a tendency to restrict the use of the term ozæna, so as to make it synonymous with the disease described known as atrophic rhinitis. This, no doubt, would be an advantage, if it could be universally done. The term ozæna, however, has been long used to indicate a group of nasal affections, characterized by one prominent symptom, viz., an intensely disagreeable smell, associated usually with more or less discharge from one or both passages, or with a tendency to crust formation in the nose. The term is often conveniently used in this sense, and may be coupled with a qualifying term, such as simple, or essential ozæna, syphilitic ozæna, strumous ozæna, &c.

The chief affections which may give rise to ozæna, in this wider sense of the word, are the following:—(1.) Atrophic rhinitis in its later stages. (2.) Syphilitic ulceration and necrosis, whether resulting from the inherited or the acquired form of the disease. (3.) Ulcerative diseases of the mucous membrane, whether due to tubercle, lupus, or malignant disease. (4.) Certain cases of chronic rhinitis, especially cases attended with purulent secretion, such, for instance, as are met with, not unfrequently, in strumous children. (5.) Traumatic causes, such as the retention in the passages of foreign bodies, rhinoliths, or bony sequestra, the result of blows or injuries. (6.) Purulent discharges from the accessory cavities, principally from the antrum.

These diseases are described in other parts of the work, under their respective headings, and only a very few points, in connection with the diagnosis of the cause of ozæna, will be alluded to here.

An offensive odour from the breath, which has existed for any time, will be found, in the majority of cases, to be due to the nose, although patients themselves, and their friends, generally attribute it to the stomach, and not unfrequently the stomach is treated for some assumed disorder, and the real source of the trouble is overlooked. If an offensive odour be present at the time of examination, by getting the patient to close the nose, and breathe through the mouth, the breath will lose its offensiveness, when the nose is the cause. In most cases of ozæna, the patient is conscious to some extent of an offensive odour, and often of an unpleasant taste. The chief exception is atrophic rhinitis. In this affection the sense of smell is blunted or absent, and in the great majority of cases the patient is quite unconscious of any odour. In empyema of the antrum the patient is troubled with a disagreeable odour, which occurs intermittently, as the pus is discharged from the ostium maxillare into the nose, but persons around rarely notice the odour in these patients.

The peculiar sickly odour of atrophic rhinitis, though difficult to describe, is, as a rule, easily recognized by those who are accustomed to it, and can be distinguished from the more penetrating, though, perhaps, not more disagreeable, odour of syphilitic ozæna. Moreover, removal of the crusts and secretions, by thoroughly cleansing the passages, causes temporary disappearance of the odour in atrophic rhinitis, while no amount of cleansing, as a rule, completely removes that of syphilitic ozæna.

A **unilateral** purulent fetid discharge suggests a foreign body, or disease of the antrum. If in a child, the probability of a foreign body is greater. We must never place

too much reliance on the history as to the entrance of the foreign body, for such history is sometimes not forthcoming, and, moreover, a foreign body may be retained many months or years in the nose, and the occasion of its entrance may be forgotten at the time the patient seeks advice.

In atrophic rhinitis the discharge is usually in the form of brownish or greenish lumps, which are expelled at longer or shorter intervals by blowing the nose. In tertiary syphilis similar lumps may also be expelled, but there is often a more or less continuous fetid discharge as well. The discharge of pus from the nose, in antrum disease, is intermittent, and is often noticed to be increased by holding the head forward.

In order to discover the cause of ozæna, a careful examination of the nasal cavities with a speculum and good light should always be made. The probe must, if necessary, be brought into requisition, and the passages may have to be thoroughly cleansed of crusts and secretions, before a complete examination can be made. The information, whether positive or negative, thus obtained, will afford the only safeguard against falling into serious mistakes, such as are only too often made.

XIII.

EPISTAXIS.

Causation.—Bleeding from the nose is a symptom of extremely common occurrence. It is very often met with in young persons, about the age of puberty, and more often in boys than in girls. It occurs often enough without assignable cause. As it is the commonest form of hæmorrhage occurring without apparent cause, it is easy to understand that, when there is present an actual morbid tendency to bleed, the bleeding should occur more frequently from the nose than elsewhere. The greater tendency to bleed from the nose, as compared with other mucous membranes, is owing, no doubt, among other things, to the great vascularity of the lining membrane, and to its greater exposure to external and traumatic influences.

The causes of nasal hæmorrhage may be divided into local and general. The **local** causes include, especially, traumatic causes, blows, injuries, introduction of foreign bodies, and “picking” the nose. Picking the nose generally causes hæmorrhage from the septum, just above the junction of the skin with the mucous membrane, where the frequent forcible detachment of crusts often leads to erosion, or ulceration. Violent sneezing or blowing the nose, or sniffing up irritant vapours or particles, will sometimes cause bleeding. It occurs in connection with many local diseases of the nose, such as acute rhinitis, atrophic rhinitis, diphtheria,

syphilis, lupus, naso-pharyngeal polypus, malignant disease, etc.

The **general** causes are mostly of a similar kind to those which tend to cause hæmorrhage from other mucous membranes. In the hæmorrhagic diathesis the nose is the part which most frequently bleeds. Hæmorrhage from the nose is a very constant symptom of leukæmia, and is common in anæmia associated with spleen enlargement, and in anæmic conditions generally. It occurs sometimes in scurvy, and is a frequent symptom of purpura hæmorrhagia. It is not uncommon at the onset, or during the course, of any of the specific fevers, especially of malignant small-pox and relapsing fever. It is met with, as a symptom, in chronic alcoholism, cirrhosis of the liver, chronic Bright's disease, and in the subjects of atheromatous degeneration of vessels. A plethoric condition is sometimes answerable for nose-bleeding, but less often than anæmic states. Any condition which causes venous congestion, such as muscular efforts, cough, especially whooping-cough, diseases of heart or lungs, or pressure on venous trunks, by tumours in the neck, may give rise to hæmorrhage from the nose. It is further said to occur, sometimes, vicariously, in place of customary hæmorrhages, hæmorrhoidal, or menstrual. Finally, habitual epistaxis is apparently hereditary in some families, independently of any general hæmorrhagic diathesis.

Where there is a predisposition to bleed, very slight causes, such as a full meal, the use of spirits or hot drinks, mental excitement or bodily exertion, may give rise to an attack, but as a rule, in predisposed persons, the actual exciting cause of each particular attack cannot be detected. When hæmorrhage occurs from such local causes as blows, injuries, ulcerations, etc., it rarely gives much trouble, unless there is present a morbid predisposition to bleed.

The source of the bleeding is in most cases low down, and near the front. This is clear from the manner in which

the blood often spurts out from the nostrils, and the frequency with which hæmorrhage can be controlled by a plug in front. From the existence of the abundant arterio-venous network on the lower turbinate bodies, some have supposed these to be the most frequent source of hæmorrhage. Nevertheless, where precise observations have been made, as to the exact source, the fore part of the septum has, in the vast majority of the cases, been shown to be the site of the bleeding point. A small erosion, at this part, will often be found to be the source of a frequently recurring hæmorrhage from the nose. The firmness with which the mucous membrane is stretched upon, and united, with the septum, is less favourable to the contractility of the vessels, than is the arrangement on the turbinate bones.

Symptoms.—Certain premonitory symptoms are occasionally experienced, such as fulness, stuffiness, or stoppage in the nose, pressure or throbbing in the frontal region, or dizziness. Where such symptoms exist, they abate with the bleeding. More usually no such premonitions are felt, the appearance of the blood dropping from the nose being the first sign. The blood usually comes from one nostril only. In general blood disorders, such as fevers or purpura, it may come from both. It usually comes in drops, rarely in a small stream. Very rarely it comes in jets. The blood is of a bright red colour, and coagulates readily, and plugs of clotted blood are often discharged. As a rule, the bleeding ceases spontaneously in a few minutes, and the quantity lost varies from a drachm, or less, to five or six drachms. On the other hand bleeding may go on for hours, or days, and large quantities, amounting even to several pounds, may be lost. The cessation of bleeding may take place by simple closure of the openings in the vessels, or it may result from the formation of clots in the nasal cavity. Too early dislodgement of such clots may lead to a repetition of the bleeding. Profuse bleeding may be attended with all the symptoms of

rapid loss of blood, such as pallor, weak pulse, singing in the ears, syncope, &c. Repeated hæmorrhages often lead to marked chronic anæmia.

It must be borne in mind that blood from the nasal cavity, especially from the back part, may pass into the pharynx. Thence it may be swallowed, or pass into the larynx and excite cough. Either of these events is more likely to happen when nasal hæmorrhage occurs during sleep, with the patient lying on his back. The subsequent coughing up, or vomiting of blood, may suggest hæmoptysis, or hæmatemesis, from disease of the lungs or stomach. In free hæmorrhage from one nasal passage, blood may flow from the healthy side, having found its way round the septum, in the naso-pharyngeal space.

There is often difficulty in determining the cause of the bleeding, whether a local or a general cause. While the possibility of some general cause must always be considered, a careful inspection should be made of the nasal cavity in all cases of severe or recurrent hæmorrhage, to detect if any local disease is present. This inspection cannot, as a rule, be made while hæmorrhage is going on, as the blood obscures the view. It must be deferred to an interval between the attacks. Careful search should especially be made at the fore part of the cartilaginous septum for an erosion, adherent scab, or blood-clot, or knot of dilated vessels.

In children, blood from the nose, sometimes, has its source in adenoid vegetations in the naso-pharynx. Bleeding from this source is never large, and more usually it finds its way into the lower pharynx, and thence may be coughed up. During sleep, blood-stained mucus will often run from the mouth and stain the pillow, in these children.

Treatment. — Hæmorrhage from the nose, in the vast majority of cases, tends to cease spontaneously, without any special treatment, beyond avoidance of such things as might increase the flow, such as stooping the head down over a

basin, a common practice, or blowing the nose. It is well to make the patient lie down, with the head and shoulders somewhat raised, and, at the same time, to apply a cold compress to the forehead and nose, or to the nape of the neck. Most hæmorrhages will soon cease under such simple treatment. Should, however, bleeding show signs of persisting, an endeavour must be made to promote coagulation of the blood in the nasal cavity. The simplest plan is to press the ala of the nose firmly against the septum for some minutes. While this is being tried, the patient is best in a semi-recumbent posture, with the head very slightly inclined forwards, so as to bring the floor of the nose into the horizontal position, whereby the blood does not flow back so readily into the pharynx. If the bleeding is from the anterior part of the septum, this pressure on the ala will directly compress the bleeding point.

Elevation of the arms above the head, attempts to produce reflex spasm of the vessels by application of cold to the spine, or to the scrotum in men, or the breasts in women, derivatives, such as a mustard foot-bath, are recommended as useful, and at all events may be tried in conjunction with the preceding methods of treatment.

If the bleeding is not soon arrested by the preceding methods, the nostril should be plugged in front. This may be done with simple dry lint, or with lint soaked in a solution of perchloride of iron or gallic acid. A single plug may be used, fitting the nostril and reaching in some distance, or, better still, several small plugs may be inserted, one after the other, with a pair of forceps until the nostril is packed, a piece of thread being attached to each, to facilitate removal. The plug should be allowed to remain *in situ* for a few hours or a day, but should not be left unchanged for a longer time than twenty-four hours, to prevent decomposition. We must satisfy ourselves, meanwhile, that bleeding does not continue into the pharynx, which may be done by

reference to the patient's sensations, or, if necessary, by ocular inspection. If the hæmorrhage has been at all severe, the patient should retain the recumbent or semi-recumbent position, for several hours, or a whole day, after the hæmorrhage has ceased. He should be kept free from excitement, and abstain from hot or stimulating drinks.

The application of cold, or of styptics, to the interior of the nose, is sometimes of service. Injections of cold water, or, better still, of hot water at a temperature of 120°, or of a solution of tincture of perchloride of iron, twenty drops to the ounce, may be employed, and will sometimes arrest the hæmorrhage immediately, but all injections have the disadvantage of washing away the clots, as fast as they are formed. Their use should be followed immediately by pressure on the ala or the use of the anterior plug. Sometimes snuffing up or, still better, insufflating, powdered tannin, or alum, is useful. Of course, the direct application of a strong styptic or a galvano-caustic point to the bleeding spot, or spots, is the best method of applying such treatment, but this is not often practicable while hæmorrhage is going on.

A more effectual method of anterior plugging, and one which will enable pressure to be brought to bear on the bleeding spots, may be had recourse to if necessary. Strips of lint, about four inches long and half an inch wide, may be gradually inserted into the nasal cavity with a probe. They may, indeed, be carried even as far back as the posterior naris. In this way the anterior part, or even nearly the whole nasal cavity, may be tightly packed. Such strips of lint may be sprinkled with powdered tannin, or soaked in weak perchloride of iron solution before introduction.

Many devices have been suggested for applying pressure to the interior of the nasal cavity. A uterine sponge tent has sometimes been used, but some form of thin india-rubber bag introduced collapsed, and injected with water or air when *in situ*, has been mostly employed. Dr. Cooper Rose's

intra-nasal air plug will be found a very serviceable instrument for the purpose.

When other means prove ineffectual, and there arises the *slightest danger* to the patient from loss of blood, the anterior and posterior nares must be plugged. To effect this, a piece of stout silk, or whip-cord, must be passed through the nasal cavity, and brought out from behind the palate through the mouth. This may be easily done by threading the string through the whole length of a flexible catheter, the end being brought out at the eye. The catheter, so threaded, is passed along the floor of the nose into the pharynx, and the end of the string is seized, in the pharynx, with a pair of forceps and drawn out at the mouth. The catheter is then withdrawn. The instrument known as Belloc's canula is the most convenient one for passing the string, but it is rarely at hand when needed. A silver female catheter, or a Eustachian catheter, serves the purpose very well. A firm plug of lint, about the size of a walnut, fashioned to fit the posterior naris, is fastened to the string, and the plug is firmly adapted to the naris, by traction on the nasal end of the string, while a finger guides it into its place behind the soft palate. The anterior naris is now firmly plugged, and the free end of the string is fixed to the skin with adhesive plaster. A short piece of string may be left hanging from the plug into the pharynx to facilitate removal.

The plugs are left *in situ* from twenty-four to forty-eight hours. It is best not to leave them longer, even though it may be necessary to introduce fresh plugs at the end of that time, as there is danger from irritation and decomposition occurring. Such accidents as gangrene, tetanus, and pyæmia have been known to occur, from neglect in this respect. It is well not to withdraw the string from the nose until it is clear whether re-introduction of the plug may be necessary. The posterior plug may be readily removed by traction on the string attached to it, or by pushing it with a probe into the

pharynx where it can be seized with a pair of forceps. After removal of the plugs, the affected nasal cavity should be carefully syringed out with some antiseptic lotion.

Internal remedies are of limited application in epistaxis, but may be administered in cases of prolonged, or frequently repeated bleeding. Ergot, gallic acid, acetate of lead, and other hæmostatics may be tried.

Causal indications frequently demand our attention. We are consulted more often on account of frequent recurrence of hæmorrhage, than of the difficulty of arresting an attack. In frequently repeated hæmorrhage, with or without apparent cause, a careful examination of the nasal cavity should always be made. Disease of the nose, such as chronic rhinitis, atrophic rhinitis, or ulceration of some kind, may be present, which requires its own appropriate treatment. Some point may be discovered whence the bleeding obviously comes, which by local treatment may be made to heal up, or to which, during a subsequent attack of hæmorrhage, we may be able to apply, directly, our styptic or pressure. As already mentioned, it is on the fore part of the septum that the signs of the bleeding point are most frequently found. Erosions or ulcers in this region must be treated with suitable ointments. Free application of some simple ointment or vaseline will prevent hard crusts from forming, the picking off of which irritates the ulcer, and re-opens the bleeding point. The surface of the ulcer should be touched, from time to time, with nitrate of silver, to promote healing. The galvanocautery is an effectual application to small eroded bleeding vessels, or minute telangiectases on the septum or elsewhere.

Anæmic, or other morbid blood conditions, obstructive diseases of the heart, cirrhosis of the liver, etc., may call for treatment. I shall not enter into the question as to what indications may render it undesirable to arrest a nasal hæmorrhage. I do not believe that any of the reported cases of serious

results having arisen, from arresting nasal hæmorrhage, will bear investigation, and I do not know of any safe indication for disregarding such hæmorrhages. In some cases the amount is trifling, and rather calls for treatment of the cause. In some conditions there will naturally be more anxiety about a moderate loss of blood than there would be about a larger amount in others. As already stated, the hæmorrhage tends to cease spontaneously, in the majority of cases, without any special treatment, but, from the first, our directions to the patient should be of a kind to favour such cessation, and should it not occur, more active measures should at once be proceeded with. If a physician believes a certain quantity of blood needs to be abstracted, it were better he should abstract the exact amount he supposes necessary, from the arm or elsewhere, than that he should neglect, or encourage, a hæmorrhage, in a region where the bleeding is only imperfectly under his control.

XIV.

NASAL OBSTRUCTION (Nasal Stenosis).

THE nasal passages and naso-pharynx may be narrowed in various ways, and the chief conditions leading to such stenosis, as well as the symptoms resulting therefrom, are described in various sections of this work. The results vary, somewhat, in relation to the nature and seat of the obstruction, the duration of the state, and the age at which it occurs. There are many important symptoms, however, common to all forms, and it will be an advantage, in many ways, to review the subject as a whole.

The following are the chief causes which give rise to nasal obstruction :—

I. Nasal Causes.—1. Congenital closure of the nostrils by a membranous structure, and congenital membranous or bony closure of the posterior nares. These malformations are rare.

2. Hypertrophy, or abnormal conformation of the middle or inferior turbinate bones.

3. Acute rhinitis.

4. Erection of the so-called cavernous tissue on the turbinate bodies.

5. Hypertrophic thickening of the nasal mucous membrane, especially of that covering the inferior turbinate bone.

6. New growths; most frequently mucous polypi; also fibrous polypi, sarcomatous and other tumours.

7. Syphilitic periostitis, and gummata.

8. Deviation of the nasal septum; dislocation of the septum from the maxillary crest; exostosis or ecchondrosis of the septum.

9. Abscess and hæmatoma of the septum.

10. Foreign bodies, rhinoliths, inspissated secretions, and crusts, and loose sequestra of bone.

11. Cicatricial narrowing or adhesions of the nasal passages, from syphilis, lupus, or injudicious use of caustics.

II. Naso-pharyngeal Causes.—1. Hypertrophic conditions of Luschka's tonsil (adenoid vegetations).

2. Naso-pharyngeal polypi and tumours.

3. Cicatricial adhesion of the soft palate to the pharyngeal wall.

4. Hypertrophy of the faucial tonsils.

Symptoms.—An immediate consequence of narrowing of the nasal passages is a feeling of discomfort, which the patient tries to relieve by frequent snuffling and attempts to blow the nose. In certain forms, such as that resulting from polypi, the discomfort will be greater in damp weather, from an increase in the obstruction. From interference with the expulsive force of the expiratory current, the removal of the secretions will be rendered more difficult, and these tend to accumulate, and further increase the obstruction. Excessive discharge of secretion, either anteriorly or posteriorly, usually coexists with all forms of nasal stenosis, and the importance of relieving stenosis, in order to effect a cure in cases of nasal catarrh, cannot be too strongly insisted upon. It is constantly noticed that when from any cause one passage is blocked, the mucous membrane in the other passage becomes hyperæmic and swollen, and this passage tends to become obstructed.

Apart from the local troubles, the effects of nasal obstruction must be considered in relation to the chief functions

with which the nose is connected, viz., respiration, voice, smell, taste, and hearing.

Respiration.—The air which enters and leaves the chest, in respiration, passes in the normal condition through the nose, mainly through the portion already described as the respiratory region. The inspired air, in its passage through the nose, is warmed, moistened, and purified. If this channel is narrowed, so as to be rendered insufficient for the respiratory current, the person so affected breathes, more or less, through the mouth.

The absence of the warming, moistening, and purifying influence of the nose on the inspired air tends to the occurrence of various disturbances in the respiratory passages. Firstly, dryness of the mouth and pharynx, especially on working in the morning, is often complained of. Chronic pharyngitis not unfrequently develops. Then the larynx, and lower air passages, are apt to suffer, laryngitis and bronchitis being frequently associated with nasal obstruction.

The mouth-breathing habit, which necessarily results from nasal obstruction, gives a characteristic appearance to the face, especially marked if developed in early life. The lower jaw is always slightly dropped to maintain the mouth open. The nose is pinched in, and the alæ are flattened against the septum, and wasted. The upper lip is often shortened, and slightly everted, the upper front teeth being thereby exposed. A peculiar formation of the upper jaw is also frequently associated with mouth-breathing in childhood. This consists in a narrowing, laterally, of the alveolar arch, and prominence of the central incisors.

Mouth-breathing imparts to the individual a vacant, listless expression. This expression is best marked in children suffering from adenoid vegetations in the nasopharynx. These children often look very stupid, and their frequently-associated deafness adds to the air of stupidity.

If the nasal obstruction be at all complete, exertion will cause some apparent labour in breathing. Indeed, these persons are apt to breathe noisily at all times, but especially in eating or drinking, for while the mouth is engaged with the food or drink, their breathing is interfered with, and thus becomes noisy and gasping. In infants, however, this difficulty reaches its height. The attempt to take the breast produces suffocative attacks, which compel the infant to stop sucking almost immediately it has begun. Serious interference with nutrition may result from the inability to suck.

During sleep the current of air, passing through the mouth, causes the relaxed velum to flap to and fro, and produces snoring. Sleep is thus apt to be disturbed, and nightmare is not uncommon. In infants and young children severe attacks of dyspnœa, or even violent suffocative attacks, occur during sleep, the tongue falling back to its natural position against the hard palate, and intercepting the breathing. In some cases the tongue is probably drawn back by the inspiratory movement, and presses the epiglottis down on the larynx. The child starts up partially suffocated, and struggling for breath. The attacks may have a resemblance to croup, and are sometimes described as such by parents. It has been suggested that the vigorous attempts at inspiration may give rise to acute hyperæmia of the lungs in young children, and so intensify the dyspnœa. The attacks appear sometimes to partake of the character of definite asthmatic paroxysms. It is probable, also, that nasal obstruction, in infants, plays an important part in the production of collapse of the lungs. Suffocative attacks are rare in adults, who more easily acquire the knack of breathing through the mouth in sleep. They do, however, occur. Definite asthmatic attacks occur fairly often in association with nasal hypertrophies, and nasal polypi. They are not, however, by any means always

nocturnal, and they perhaps arise mainly in a reflex manner (see Reflex Nasal Neuroses).

Chest deformity, consisting of a sinking in of the lower costal cartilages and prominence of the upper part of the sternum, which has long been described as associated with large tonsils, may arise from any form of nasal obstruction in young children, and has been especially noticed in association with adenoid vegetations. It has been objected that, although large tonsils may produce the deformity, since they interfere with the inspiratory effort by obstructing the current through both the mouth and nose, yet obstruction in the nose alone would not lead to the same result, as it could not matter whether air enters through mouth or nose. But we have seen that in sleep, at all events, great inspiratory difficulty may arise from obstruction of the nose alone.

Interference with perfect aeration of blood may, no doubt, contribute to the anæmia, mal-nutrition, and even the dulness of intellect, often observed in children and others, the subjects of nasal obstruction.

Voice.—Alteration in the character of the voice is an invariable accompaniment of nasal obstruction. The alteration varies with the seat and extent of the obstruction. If the naso-pharynx is completely obstructed, as with adenoid vegetations, the voice acquires a “dead” sound, and it will be impossible to pronounce the nasal sounds *m*, *n*, *ng*. Thus *man* becomes *bad*, *nose* becomes *dose* or *lose*, *song* becomes *sogg*, etc. When the obstruction in the naso-pharynx is less complete, the voice is wanting in resonance, has a flat character, and the nasal consonants are not distinctly pronounced. If the obstruction be in the anterior part of the nasal passage alone, the voice, generally, acquires a nasal twang. This twang varies much, but in general partakes of the character of what we call speaking through the nose. The nasal consonants can be pronounced, but the resonance is altered, and has a distant character.

Smell and Taste.—The sense of smell is interfered with or abolished, by the obstruction to the current of air over the olfactory region. Taste is also interfered with. Nevertheless, the olfactory region may be patent at the posterior nares, although there is obstruction in front, and thus the expiratory whiff, which takes place after swallowing, may reach the upper and back part of the nasal cavities, and enable flavours to be appreciated by the organ of smell. Thus taste may be sometimes almost normal, while smell is abolished. It is also to be remembered that the sense of smell may be abolished by obstruction of the upper part of the passages, say with mucous polypi, while respiration through the nose is unimpeded owing to the free patency of the inferior meatus.

Hearing.—Not the least important complications of nasal obstruction are deafness, tinnitus, and ear disease. Apart from mechanical pressure on the orifices of the tubes by obstructing growths, and apart from the extension to the tubes of the almost ever present catarrh, complete nasal obstruction acts injuriously in another way. When the nostrils are completely closed, each act of swallowing tends to exhaust air from the tympanic cavities, and to retract the tympanic membrane. Instead, therefore, of equalizing the atmospheric pressure within and without the tympanic cavity, each act of swallowing, when there is complete nasal obstruction, tends to retract abnormally the tympanic membrane, and in time this must lead to injurious consequences to the functions of the ear.

Treatment.—This will of course vary with the cause. The treatment of the more important of the causative conditions will be found in other sections of the work. The necessity of removing severe nasal obstruction will be obvious from a consideration of the effects of obstruction above alluded to. Children are often found to improve in a remarkable manner, physically and mentally, after successful

removal of nasal obstruction. Where the nasal stenosis is not severe it may be difficult to decide upon the advisability of operating. We shall then have to consider whether there is sufficient breathing space, and whether any bad effects seem to have arisen from the narrowing. The contact of parts within the nose, which should normally be separated, is also an indication, taken with other things, for interference.

XV.

REFLEX NASAL NEUROSES.

DURING the last few years much attention has been directed to the dependence of various morbid phenomena upon intra-nasal irritation. These phenomena embrace conditions some of which are connected with the nasal apparatus, while others implicate more distant parts. They are variously sensory, motor, vaso-motor, and secretory, in their nature, and as they have been held to arise in a reflex, or some analogous manner, they have been termed reflex nasal neuroses. The importance of the subject has, no doubt, been exaggerated by some observers, and the frequency of the interdependence, between nasal irritation and many neurotic affections, has been probably overrated. Nevertheless, when every allowance is made for the enthusiasm of workers in a new field, there remains, beyond doubt, a tolerably wide range of affections, chiefly of the respiratory tract, but also of other parts, which can arise in consequence of intra-nasal irritation, and which, whether they so arise or not, can be removed by treatment directed to the nose.

Although the connection between nasal disease and other morbid phenomena had not altogether escaped the older writers,* it was for practical purposes unrecognized, until Voltolini,† in 1871, called special attention to cases of asthma

* See historical sketch by J. N. Mackenzie, *New York Med. Journ.*, August, 1887.

† "Die Anwendung der Galvanokaustik." Wien, 1871.

dependent upon nasal polypi. His observations were soon confirmed by others (*B. Fränkel, Hänisch, Hartmann, Schäffer, Porter, etc.*), and about the same time the occasional dependence of asthma on chronic rhinitis was also demonstrated. The scope of the affections producible by nasal disease was soon extended. Hack, especially, drew attention to this subject in various contributions, but particularly in a monograph* in 1884. In this work, Hack set forth that turgescence of the erectile tissue on the anterior end of the inferior turbinate body, on one or both sides, resulted from a variety of causes, some of them seated in the nose itself, some acting from without; and that many neurotic conditions, such as cough, asthma, hay-fever, migraine, etc., arose in a reflex manner from stimulation proceeding from this part. He recorded cases in which these affections were cured by destroying the erectile tissue in this situation. Since then the subject has been further investigated by Hack himself, by B. Fränkel, Sommerbrodt, Schäffer, Schech, John N. Mackenzie, Hering, and very many others. Hack's first view, viz., that the erectile area on the anterior end of the inferior turbinate bodies is the point whence proceeds the stimulus which gives rise, in a reflex manner, to the affections in question, has not been confirmed by the observations of others, nor, indeed, by his own later observations. It is now admitted on all hands that other portions of the inferior turbinate body, the middle turbinate body, and the septum are all, at different times, the seat of the irritation which gives rise to reflex symptoms. The same is also true of the naso-pharynx.

Reflex nasal neuroses have been traced to a variety of morbid conditions in the nasal passages, such as chronic rhinitis, hypertrophic changes, diffuse or circumscribed, nasal polypi, and adenoid vegetations in the naso-pharynx. The contact of otherwise distant surfaces, such as of the

* "Erfahrungen auf dem Gebiete der Nasenkrankheiten." Weisbaden, 1884.

middle or inferior turbinate body with the septum, whether due to septal deformity or otherwise, has a decided influence in setting up reflex symptoms. Although it must be admitted that the sensory area within the nose, through stimulation of which reflex morbid phenomena arise, is by no means so limited as some have held, yet the portion richly endowed with cavernous tissue undoubtedly plays an important part in their production. Erection of the cavernous tissue of the inferior turbinate body, oft recurring and transitory, or of a more persistent character, is frequently present together with other nasal or naso-pharyngeal morbid conditions, and it may in such cases act as an intermediate link between the nasal disease and the secondary neurosis; but this is by no means always the case. Indeed instances of reflex neuroses have been observed associated with atrophic rhinitis (*B. Fränkel, Schmalz, Hopmann*), a disease in which the cavernous tissue has completely disappeared.

The tendency to the occurrence of reflex neuroses varies in different individuals. A condition of the nose which, in the majority of cases is unassociated with any reflex trouble, may in a particular individual give rise to a train of phenomena of the kind we are considering. Undoubtedly, in the majority of instances, some general neurotic tendency, some condition of the nervous reflex paths, such as underlies neurasthenia or hysteria, will be found to be present in these cases. Yet a general neurotic tendency is not a necessary antecedent. Pathological conditions in the nose may set up, through prolonged irritation, hyperæsthesia of the nasal mucous membrane, gradually increasing in intensity, which leads to a morbid excitability of certain nerve tracts or centres, and not only gives rise to excessive physiological reflexes, but in course of time to those of a pathological nature.

It is beyond dispute that the several maladies, to be

presently enumerated, have in many instances been ameliorated or cured by treatment of various kinds applied to the nose or naso-pharynx. The question, however, arises whether the cure of certain symptoms by treatment directed to the nose, especially in the case of such energetic treatment as the application of the galvano-cautery, is a proof that these symptoms necessarily took their origin in some morbid condition of this region—that they were, in fact, true reflex nasal neuroses. This is an important question, and it is from want of its due consideration that many extreme statements have been put forward, which have not unnaturally led to much of the scepticism with which the subject of reflex nasal neuroses is viewed in some quarters.

If we examine the cases in which a cure of various symptoms is effected by intra-nasal treatment, we find that, in many of them, there is present in the nasal passages some disease or abnormality, such as may be supposed to cause irritation of the sensory nerve endings, and thus reflexly excite the symptoms in question. In other cases, however, no such disease is present, but there is merely evidence of excessive hyperæsthesia of the nasal mucous membrane, a peculiar susceptibility to external irritants, or a liability to vaso-motor disturbances, or there is absolutely no departure whatever from the normal conditions.

In the first class of cases we find that removal of the cause of irritation in the nose is followed by disappearance of the reflex symptoms. Although, possibly, in exceptional cases, this result may be susceptible of some other explanation, still it is reasonable to suppose that in the majority of cases we have to deal with a malady the symptoms of which owe their origin to intra-nasal irritation, and are excited through the intermediation of the nervous system, in the same way as occurs in connection with diseases of many other regions of the body.

It is different with the second class of cases. Here also local treatment, whether with the galvano-cautery or some caustic substance, such as chromic acid, is followed by amelioration or cure of the so-called reflex symptoms. It may be that in some of these cases the patient possesses at the outset a peculiar hyperæsthetic mucous membrane, and that the neurosis in question is reflexly excited by irritation of the hyperæsthetic area, possibly of a transient and undetected character; or we may suppose, with Hack, that the cavernous tissue is excessively liable to distension under various influences, and in consequence of this distension the reflex symptoms take origin. These explanations are correct, no doubt, in some instances, but it is equally clear that, in other cases of this class, the hyperæsthesia and vasomotor irritability of the nasal mucous membrane are symptoms of some general neurotic tendency, of which the so-called reflex neurosis is another, and a quite independent manifestation. The fact that local treatment relieves the symptoms might seem at first sight to be sufficient evidence of their nasal origin. If, however, we admit that certain neuroses can arise in a reflex manner from intra-nasal disease, this implies that there exists a nervous tract along which stimulation from the diseased part in the nose may be conducted to the seat of the neurosis. Such being the case, it is conceivable enough that active stimulation of the diseased part, as with the galvano-cautery, may effect a change in the symptoms, even when the symptoms arise from some independent cause.

That this latter explanation of the success of intra-nasal treatment in some cases, is correct, is beyond doubt. It must be added, that since there is strong reason to believe that turgescence of the cavernous tissue is, in many cases, the immediate exciting cause of a reflex neurosis, any treatment which effectually prevents the distension from taking place may well mitigate the same neurosis, even where the

vaso-motor irritability in the turbinate bodies, and the neurosis in question do not stand in the relation of cause and effect, but are each the effects of some general morbid tendency.

The possibility of the origin of certain neuroses from nasal irritation has received support from experiments on animals, especially from the researches of François Franck,* who performed a series of investigations, with a view of elucidating this question. Franck was able to show by these experiments, performed on dogs, cats, and rabbits, that irritation of the nasal mucous membrane produced various disturbances in the respiratory and circulatory system (the respiratory and circulatory effects were alone investigated), such as laryngeal and bronchial spasm, spasmodic movements of the respiratory muscles, slowing of the heart's action, and dilatation of the vessels of the head, on one or both sides.

The sensory nerve endings in the nose, which are concerned in the production of reflex symptoms, are those of the fifth nerve. The olfactory nerve, however, seems occasionally to be the channel by which impressions are conveyed to the nerve centres, which give rise to reflex phenomena.

The following are the principal affections which have been found to arise, more or less frequently, in connection with nasal disease or intra-nasal irritation of some kind, and in which a cure has been effected by treatment of the nasal condition.

Nervous or Periodic Coryza.—Certain individuals are liable to be seized, at longer or shorter intervals, with such symptoms as sneezing, serous discharge, nasal obstruction, and conjunctival injection. Such attacks are apt to develop very suddenly and rapidly, and to subside equally rapidly. The attacks may last from some minutes to several hours or longer. The sneezing is sometimes very violent

* "Archives de Physiologie, normale et pathologique." July, 1889.

and prolonged, and constitutes the most prominent symptom (**paroxysmal sneezing**). In some cases, the discharge from the nose is extremely profuse (**rhinorrhœa**). The rapid occurrence and subsidence of the attacks, and the absence of constitutional symptoms, serve, among other points, to distinguish them from attacks of acute rhinitis, though they are often referred to by patients as "colds in the head."

The essential element of the attack seems to be a vaso-motor disturbance, and the term **vaso-motor coryza** (*Herzog*) has been appropriately applied to the malady. The attacks result undoubtedly, in a large number of cases, from irritation of a peculiarly hyperæsthetic nasal mucous membrane, and are, therefore, properly included in the class of reflex nasal neuroses. They are, indeed, the commonest and most familiar of this class of affections, and often precede, or accompany, the development of other neuroses affecting more distant parts. Whether we term the attacks nervous coryza, periodic coryza, idiosyncratic coryza, vaso-motor coryza, or otherwise, we must recognize that they belong to that large group of cases, of which hay-fever is a well-known instance, in which coryza, and often other associated symptoms in the respiratory tract, are rapidly developed from a variety of exciting causes, some of which are known, and some unrecognized, but in which a certain morbid predisposition on the part of the individual forms the real groundwork, and the common bond of union, between cases which apparently own different causes.

This morbid predisposition, sometimes termed idiosyncrasy, consists undoubtedly of one or both of these factors, viz., a hyperæsthesia of the terminal nerve filaments in the nasal mucous membrane, and an undue activity of certain nerve centres. Either of these factors may be a part of some general neurotic tendency, and the attacks of nervous coryza may be merely the modes in which this tendency exhibits itself, in the particular individual. On the other hand,

either may result from pathological conditions in the nose. Hyperæsthesia of the nasal mucous membrane may undoubtedly result from prolonged irritation, produced by such pathological conditions. The morbid excitability of the nerve centres concerned may be acquired by prolonged irritation of the sensory nerve endings connected with those nerve centres. Thus it is that organic changes within the nose, such as hypertrophic conditions, polypi, deflections of the septum, etc., combined, perhaps, with prolonged erection of the cavernous tissue, by leading in process of time to a hyperæsthetic state of the nasal mucous membrane, may be the original cause of the morbid predisposition, of certain individuals, to the class of affections under consideration.

The actual exciting causes of attacks of nervous coryza seem to be almost innumerable. In a large number of cases the attacks occur without assignable cause. In many patients they are chiefly observed on rising in the morning. In women they are sometimes noticed to be most marked about the menstrual period. Dust of any kind, in- or out-door, is a frequent cause. Among the many causes which affect various individuals may be mentioned the pollen of a variety of plants, the powder of ipecacuanha, colocynth, scammony, or linseed, the exhalations from various animals, such as cats, dogs, horses, rabbits, hares, guinea-pigs, the skins of various animals, the odour of violets, and other scents. Sudden exposure to light will induce an attack in some individuals, especially in children. Attacks may also be induced, in certain persons, by violent exercise, by impressions on the sensory nerves of the skin, or by psychical causes. As an instance of the latter, may be mentioned a case reported by J. N. Mackenzie,* of a lady who suffered from such attacks whenever she smelt a rose, and in whom a severe attack was produced by smelling an artificial rose, which she believed

* Amer. Journ. of Med. Sciences, 1886.

to be real. As already stated, the immediate exciting cause of the attacks in a large number of cases is unrecognized.

Cough.—Cough, often of a paroxysmal or convulsive character, is an occasional reflex result of nasal irritation. It is necessary to bear this in mind in cases where persistent cough cannot be accounted for by anything in the throat and chest. Mechanical irritation of the nasal mucous membrane, with a probe, will, in certain persons, produce cough. Both the anterior and posterior parts of the inferior turbinate body have been found, by different observers, to be the more sensitive part in this respect, but the cough will sometimes be produced by irritation of the middle turbinate body and of the septum. In other cases, again, irritation of the posterior wall of the naso-pharynx with a probe will excite cough. It must not be forgotten that cough, associated with nasal or naso-pharyngeal disease, may be due to a trickling down of mucus, from these parts, on to the inter-arytenoid fold of the larynx.

Bronchial Asthma.—The connection between bronchial asthma and nasal troubles is very striking. The asthma occurring simultaneously, or alternately, with the coryza of hay-fever is a well-known instance. Many people, subject to asthmatic symptoms, are liable to attacks of sneezing in the mornings, and the history of most asthmatics records a period when paroxysms of sneezing were common. Since Voltolini's observation, numerous cases have been recorded of asthma, associated with nasal polypi, and disappearing with their removal. Indeed this relationship is familiar to every one who sees many cases of nasal polypi. Besides polypi, other sources of intra-nasal irritation may set up asthma. Chronic turgescence of the erectile tissue on the anterior or posterior end of the inferior turbinate body, enlargements and diseased conditions of the inferior or middle turbinate, deflections of, or outgrowths from, the septum, have, all, been found playing a part in the causation

of asthma. Although complete nasal obstruction sometimes coexists with polypi, and other nasal affections associated with asthma, it is by no means a necessary accompaniment, and there is frequently little or no obstruction. Indeed cases of polypi, with complete nasal obstruction, have been recorded, where the asthma did not occur until partial removal of the polypi had produced a passage for nasal respiration. It must be understood that not only definite, typical spasmodic asthma, but chronic conditions more often classed as chronic bronchitis, where the symptoms are tightness of the chest, cough, and sibilant râles, may arise from intra-nasal irritation. As to the exact nervous mechanism by which asthmatic affections arise from nasal disease, it is useless to speculate, while there is still much difference of opinion about the nature of the narrowing of the bronchial tubes in asthma, whether due to muscular spasm, hyperæmia, or œdema, or a combination of these.

Redness and Swelling of the Skin of the external nose, and the adjacent parts of the face, is a reflex vaso-motor phenomenon sometimes observed. At times it is a mere transitory hyperæmia, and may be confined to the tip of the nose. In other cases there is considerable œdematous swelling, as well as redness, and this may supervene in acute attacks resembling erysipelas. Permanent redness, and infiltration of the skin, may result from repeated attacks.

Headache, Migraine, and Neuralgia of the Trigemini are not uncommon reflex nasal neuroses. The headaches may occur as frontal or occipital pains, or as a dull pressure on the vertex. Typical neuralgia is most frequently seated in the supra-orbital branch of the fifth, but may attack the infra-orbital or dental branch. A relationship between typical migraine, paroxysmal sneezing, and asthma has long been recognized.

Vertigo, Epilepsy, Chorea, Nightmare, and other

neuroses, have been ascribed by Hack and others to intra-nasal irritation, and cases have been reported of their relief by appropriate treatment directed to the nose.

Paresis of the Palate.—A condition of the soft palate in which the distinction between the anterior and posterior pillars is lost, is not uncommon. Woakes considers this to result frequently in a reflex manner from nasal disease.

Paræsthesiæ of the Pharynx.—Various disturbances of sensation in the throat, such as a feeling of a foreign body, or of fulness, tightness, or constriction of the throat, or a feeling of constantly wanting to swallow, may depend upon pathological conditions of the nose. These feelings often arise from pathological conditions of the pharynx itself, or of the follicles at the base of the tongue, but in other cases they depend upon intra-nasal affections, and only yield to treatment of such affections. It may be a question whether we should speak of these cases as instances of reflex neuroses, or rather of a difficulty, on the part of the patient, of localizing sensations (*Schadewaldt*).

Spasm of the Glottis.—Cases of spasm of the glottis, presenting various features, have been recorded by Hack, Hering, Ruault, and others, which appeared to depend on reflex irritation starting from diseased conditions in the nose. Cure of the spasm followed treatment of the nasal affection in many cases.

Paretic Conditions of the Vocal Cords, such as insufficient approximation, tremor, or imperfect adduction of one cord, have also been observed in association with nasal disease, and relieved by treatment thereof. The disappearance of functional paresis of the vocal cords, under stimulation of any kind, is, however, so commonly seen that little reliance can be placed on this as a proof of the causative relationship.

Exophthalmic Goitre.—Hopmann, Hack, and B. Fränkel have reported cases of exophthalmic goitre which have been

cured by treatment of nasal disease. Semon has reported a case bearing on this subject. A few days after an operation for removal of nasal polypi with the galvano-cautery loop exophthalmos of the right eye suddenly appeared. Graefe's and Stellwag's signs were present, but no thyroid enlargement or heart symptoms.

Ocular Disturbances.—Various ocular troubles, such as photophobia, epiphora, *muscæ volitantes*, asthenopia, etc., have been described as arising reflexly from nasal disease.

Ptyalism has been described by Schech and E. Fränkel as arising reflexly from nasal irritation.

Diagnosis.—The various affections above enumerated, and still others not mentioned, have, in the judgment of competent observers, been more or less frequently found to have arisen as results of intra-nasal irritation. In some instances, these affections may depend on nasal disease without having been in any sense reflexly excited. Thus supra-orbital neuralgia, occurring in connection with acute nasal catarrh, may be due to extension of inflammatory swelling to the frontal sinus, and thence to the sheath of the nerve. Cough may result from the trickling back of mucus on the larynx, especially in the recumbent position. Giddiness may arise from a secondary affection of the ear.

How do we arrive at the suspicion that a given neurosis is of nasal origin? In the first place, the coexistence of some chronic nasal trouble may be known, and the knowledge that the neurosis in question has sometimes a reflex nasal origin will lead us to direct our attention to the nose as the possible cause. Then, again, some of these affections, such as periodic coryza, and paroxysmal sneezing, have a more obvious connection with the nose, and our attention should, in the case of these complaints, be directed to the nose from the first. In other diseases, such as asthma, migraine, paroxysmal cough, etc., certain symptoms may be present during the attack, or in the intervals, which may excite sus-

picion of a nasal origin. A careful inquiry into the history will often reveal such symptoms, although at the onset of our inquiries the patient may declare that he has never suffered from the nose. Transitory attacks of nasal obstruction, attacks of sneezing, and watery discharge from the nose, are the symptoms we should especially look for. Patients attribute little importance to them, and they may have existed in times gone by, during the early period of the neurosis, and have passed out of recollection until questioned on the point. Sometimes patients complain of an itching or creeping in the nose, or a feeling of pressure at the root of the nose, and such feelings may be especially noticed before the onset of the attack. Sometimes little or nothing may be obtained from the history given by the patient, and the suspicion may arise from the failure of all the ordinary methods of treatment, and from the knowledge that the neurosis in question does unquestionably arise, in some cases, from nasal disease.

Whenever the suspicion arises that a neurosis is of nasal origin the case should, as far as possible, be put to further proof. Examination of the nose may reveal some obvious disease, such as mucous polypi, which, on other grounds, would call for treatment. Of course it is quite possible for a person to have a polypus in the nose, and a neurosis somewhere else, without any necessary connection between the two, but if removal of the polypus is followed by relief of the neurosis, it would certainly point very strongly to the dependence of the neurosis on the polypus. Short of this, however, much information is often obtained by the use of the probe in the case of certain supposed reflex maladies. Mechanical irritation with the probe may discover hyperæsthetic areas in the mucous membrane, and if, as is not unfrequently the case, such irritation evokes symptoms of the neurosis from which the patient is suffering, whether coryza, cough, asthmatic symptoms, cephalalgia, or other-

wise, this affords a presumption that the patient's trouble is of nasal origin.

Cocaine is sometimes a most valuable aid to the diagnosis of reflex nasal neuroses. If we can, by the application of cocaine to the interior of the nose, relieve or cut short an attack, we have very strong evidence of the nasal origin of the neurosis. A five or ten per cent. solution may be applied with a brush or spray-producer, and in the case of a one-sided neurosis, such as supra-orbital neuralgia, we choose the corresponding side; in other cases we select, first, the side in which the more marked morbid changes are present, and after a quarter of an hour or so, if there is no result, we repeat the application on the other side, or we may simultaneously anæsthetize both cavities. If there is no result, the probability that the neurosis is of nasal origin is diminished.

In some cases a very exact experiment may be performed. Irritation with a probe at some particular spot may set up symptoms of the neurosis, and subsequent careful anæsthetization of this spot with cocaine may allay the symptoms in the course of five or ten minutes.

It is well to remember that, as a matter of experience, sharp projections, or spurs, on the septum, are very frequently associated with hyperæsthesia of the nasal mucous membrane, and reflex symptoms of various kinds. Marked erection of the cavernous tissue on the inferior turbinate is also a very frequent condition in cases of reflex nasal neurosis. Such erectile swelling may be absent at a first examination, and yet be subsequently found present, for these swellings will sometimes subside under the psychical influences attending a first examination.

Treatment.—The success of the treatment depends, in the first place, on the correctness of our diagnosis of the nasal origin of the malady, and secondly, on the judgment, thoroughness, and patience with which we carry out the local treatment.

The local treatment must be designed to fulfil two objects. One is the removal of such pathological conditions as may be supposed to have contributed to the production of a hyperæsthetic state of the mucous membrane, and the other is the destruction of excessively hyperæsthetic areas in the mucous membrane, more especially, of course, such as, when irritated with a probe, give rise to the morbid reflex symptoms. Polypi must be removed. Marked erectile swellings are to be reduced, in the manner described in the section on chronic nasal catarrh, the galvano-cautery being here probably the most serviceable means at our disposal.

Prominent ridges on the septum, especially if they are in contact with the turbinate bodies, should be removed, a procedure generally best effected by means of Bosworth's nasal saw. Hyperæsthetic areas are best treated with the galvano-cautery, although the application of chromic acid will often serve the purpose. Other diseases or abnormalities may be treated in the manner described in the various sections of this work.

In many cases we may expect in this manner to effect a complete and permanent cure of the neurosis. In other cases we only succeed in alleviating the symptoms without completely curing them. In other cases, again, after marked improvement or cure has been obtained, we are disappointed to find that, in course of a longer or shorter time, a relapse occurs. In the latter case, renewed nasal treatment may again effect a cure.

The permanence and completeness of our cure will be aided by attention to the general condition of the patient. A general neurasthenic condition may be present which will call for treatment with nervine or other tonics, as well as suitable hygienic and moral treatment. But it stands to reason that such a neurasthenic condition does not contraindicate intra-nasal treatment. On the contrary, its presence

is an additional reason for mitigating the neurosis of nasal origin, as speedily as possible.

It has been already mentioned that even when the neurosis does not depend on nasal irritation, and even where no abnormality can be detected in this region, it is possible that strong stimulation applied to the nasal mucous membrane may effect amelioration of the symptoms. Sufficient success has attended the destruction, with the galvano-cautery, of the cavernous tissue on the anterior or posterior parts of the inferior turbinate bodies, in alleviating various maladies, to warrant our having recourse to such a measure, when other means of treatment have failed.

XVI.

HAY-FEVER (**Hay-Asthma**).

Causation and Nature.—Hay-fever is a peculiar affection of the air passages, which attacks predisposed persons at a certain period of the year. The affection is characterized by irritation, vascular congestion, and increased secretion of the nasal and conjunctival mucous membrane, and, it may be, of more or less of the whole respiratory tract, down to the smallest bronchi. Sometimes definite attacks of bronchial asthma supervene.

The affection prevails in this country, as well as in France and Germany and other European countries, in the late spring and early summer. The attack does not usually begin till after the middle of May, and usually ceases in the first or second week in July. In the United States two seasonal varieties prevail; one occurring about the same time of year as in England (June cold, rose cold), the other in the early autumn (autumnal catarrh), from the middle of August to the end of September. The disease appears to affect especially the Anglo-Saxon race, being of much more frequent occurrence in England and the United States than in other countries. In Asia and Africa it is said that only the English and Americans suffer. In America, negroes and Indians scarcely ever suffer from the complaint.

The predisposition to hay-fever is often inherited. Cases are common where several members of a family are subject to it, and sometimes it has been traced through several

generations. It is more frequent in the male sex in the proportion of about three to two. As to age, the liability of the disease appears to be greatest between twenty and forty. It sometimes begins in early childhood, and rarely appears for the first time after forty.

The disease occurs much more frequently among persons of the educated classes, and those who do brain work, than among the lower classes, and such as earn their living by manual labour. Dwellers in cities are more prone to the disease than country people; the agricultural labourer, who must be supposed to be the most exposed to its influence, being perhaps, of all persons, the least affected. This incidence of the disease, on persons of a particular mode of life, is intimately associated with the fact that the nervous temperament is undoubtedly a powerful predisposing cause. A neurotic inheritance is in many cases indicated by the existence of neuroses, such as hysteria, epilepsy, etc., in the family.

Much discussion has taken place as to the exciting cause, or causes, of hay-fever. Some of this might have been spared if there had been a clear understanding as to what the term hay-fever was intended to designate. I think, if the term is to be retained at all—and it would be hard to get rid of it—it is best reserved for the coryza, with other associated symptoms, which periodically recurs, in certain people, at the particular seasons of the year above mentioned. Now it is clear that at the season in which hay-fever, in this sense of the word, prevails, there is some widely-spread influence at work, and the question is, what is the nature of this widely-spread influence?

It is well known that various exciting causes will set up paroxysms of coryza, etc., exactly resembling hay-fever, in certain individuals, at any season of the year (*see* p. 126). Of all these various causes, the application of pollen to the nasal mucous membrane is the most frequent, and the most

active. During the hay-fever season the local irritants, contained in the summer air and summer dust, are no doubt numerous, but it is certain, as the result of many observations and experiments, that pollen is that which irritates most. Blackley's* experiments show beyond doubt that the hay-fever, which occurs in this country, is due more especially to the contact with the nasal mucous membrane, and to some extent with the conjunctiva, of the pollen of flowering grasses and cereals which blossom at this time of year, and, moreover, that the rise and progress and fluctuations of the malady, during its season of prevalence, correspond with the varying amount of pollen in the air at the time. It has been proved that, among the grasses, those most productive of hay-fever are the sweet-scented vernal grass (*Anthoxanthum odoratum*), the rye-grass (*Lolium perenne*), and the sweet-scented soft grass (*Holcus odoratus*). It has been shown, too, that the fresh plant is less powerful than the hay made from these grasses. It seems, too, that grasses have a larger part in the production of hay-fever in England than in America. There, the researches of Marsh, Wyman, and others, have shown that the pollen of the *Ambrosia artemisiæfolia*, or Roman wormwood, or rag-weed, as it is commonly called, plays the most important part in the production of the autumnal variety. The rose also appears to be more potent in producing symptoms in America (rose cold) than in this country.

It may be considered as established that it is the widely-diffused presence of pollen in the air, at certain seasons, which causes the annually-recurring malady known as hay-fever. Nevertheless, it must be thoroughly understood that hay-fever is merely a particular instance of that large group of cases where vaso-motor and secretory disturbances, in some part or the whole of the naso-bronchial tract, occur in connection with a variety of exciting causes, of which

* "Hay Fever." London, Second Edition, 1880.

pollen is one, and to which group of cases reference has been made in treating of reflex nasal neuroses. The terms nervous coryza, vaso-motor coryza, or idiosyncratic coryza, may be conveniently applied to these cases of recurring attacks of coryza, and the name hay-fever may be retained for the annually-recurring seasonal variety, it being understood that hay is only one, and in this country the commonest, cause.

It is doubtful whether dust, sunshine and heat, and other things which have been suggested as exciting causes, can be considered as more than accessory or aggravating influences in hay-fever. Aggravating influences they no doubt are, for it will be found that the majority of the subjects of hay-fever are liable to attacks of sneezing, coryza, etc., at other times of the year, from such causes as dust of any kind, in- or out-door, sudden exposure to sunlight, and various other influences.

The important question as to how far intra-nasal disease enters into the causation of hay-fever remains to be considered. Little attention was paid to this question till of late years. In consequence, however, of the labours of Daly, Roe, Hack, Herzog, Sommerbrodt, Bosworth, and many others, it has been established that hay-fever and the allied forms of paroxysmal coryza, are in a large number of cases associated with some abnormal condition of the intra-nasal structures, and that improvement or complete cure of the complaint can often be obtained by treatment of such condition. Among the diseases and abnormalities which have been observed in association with hay-fever may be enumerated marked deviations of, or out-growths from, the nasal septum, hypertrophic rhinitis, enlargement of the inferior or middle turbinate bodies, mucous polypi, and marked turgescence of the cavernous tissue on the inferior turbinate body. Excessive hyperæsthesia of the nasal mucous membrane, either over a limited area, or more or less generally, is usually present.

The manner in which pathological conditions of the nose may be supposed to give rise to the morbid predisposition underlying hay-fever has been referred to in the section on reflex nasal neuroses (p. 126). It was there pointed out that pathological conditions may, by long-continued irritation of the sensory nerve endings in the nose, bring about a hyperæsthesia of the nasal mucous membrane, as well as a morbid excitability of certain nerve centres, even if none existed at the outset. An irritant will then affect this hyperæsthetic area, which in the healthy condition would be insufficient to produce any effect. The first reflex symptoms will generally be experienced in vaso-motor and secretory disturbance of the nasal passages; but, by-and-by, other associated centres will be involved, and a train of reflex symptoms will occur in the whole naso-bronchial tract. It is, moreover, obvious that intra-nasal irritation will set up reflex symptoms in certain persons more readily than in others, and that a nervous temperament is an important determining influence. Since, too, it cannot be denied that hay-fever occurs apart from pathological conditions of the nose, it may be right in such cases to regard it, so to speak, as an independent neurosis, manifesting itself by a peculiar hyperæsthesia of the nasal and, it may be, of the ocular mucous membrane, together with a morbid excitability of certain nerve centres.

Symptoms and Course.—The earliest symptoms of hay-fever are, usually, an itching sensation in the roof of the mouth and on the palate. Irritation inside the nose is also experienced, and very shortly paroxysms of sneezing set in. The nose soon becomes stuffy and obstructed, and runs with a clear watery discharge, especially copious after the attacks of sneezing. Itching of the eyelids and near the inner canthi is felt, and the edges of the lids are reddened. Pain in the eyeballs and in the frontal region is often complained of. These symptoms may take several days to fully develop,

and they are apt to be more marked in the mornings, giving the attack an intermittent character.

After some days the symptoms become more persistent and severe. The nostrils are completely occluded, compelling the patient to breathe through the mouth, and the paroxysms of sneezing are extremely violent. The obstructed condition of the nostrils is subject to rapid changes, and in lying down the undermost nostril is often the more obstructed, apparently from gravitation of blood and serous effusion. The conjunctivæ become congested and red, profuse lachrymation occurs, and the lids are often œdematous. The whole face, in severe cases, is red and swollen. The lining membrane of the mouth, pharynx, and tonsils partakes of the irritation, and becomes more or less red. The senses of taste and smell are impaired, and sometimes there is partial deafness.

During the course of the attack the patient complains of some lassitude and weakness, and there is generally an incapacity for intellectual work. Slight feelings of chilliness are common, and a little pyrexia may occasionally be present during some part of the attack, but as a rule there is no increase in either pulse or temperature. Itching of the skin of the scalp, face, chest, and shoulders, is common, and sometimes an urticarial eruption is present.

In many cases, and especially in persons who have had attacks several times previously, catarrhal symptoms in the lower respiratory tract supervene on the coryzal symptoms. A short dry cough, and some tightness of the chest, may be present, attended with an expectoration which is at first thick and scanty, and later on becomes more profuse. Sometimes definite attacks of bronchial asthma occur, exactly like attacks unconnected with hay-fever, and, like these, they occur more frequently at night. In some persons, especially in those who have suffered for several years, the coryzal symptoms give place almost entirely to asthmatic

symptoms, and occasionally the two sets of symptoms seem to alternate.

After the symptoms have existed for three or four weeks, sometimes longer, sometimes shorter, they gradually subside. The course of the case is of a more or less remittent character throughout. The severity, duration, and special localization of symptoms vary much in different individuals, and to some extent in the same individual, in successive years.

Once a person is affected with hay-fever he may be expected to have it every year, unless he happens to remove to a suitable locality during the season. It may continue to an advanced age; but probably the majority of people lose the susceptibility to it somewhere about forty or fifty years of age. Some hay-fever patients become subject to asthmatic attacks at other periods of the year than the hay-fever season, and these persons may develop in time into confirmed asthmatics. Conversely, it will be found by careful inquiry into the history of asthmatic people, that a goodly number of them suffer, or have in former times suffered, either from hay-fever or from some allied form of paroxysmal coryza.

Treatment.—Persons subject to hay-fever may, if circumstances permit, endeavour to secure exemption from the malady by a change of residence during the hay-fever season. A sea voyage is the most effectual method of securing exemption. A change to the seaside generally gives relief, especially if a situation can be selected backed by high cliffs, and where the prevailing winds are from the sea. The centre of a large town is preferable to a country residence.

Patients suffering from hay-fever get relief by staying indoors as much as possible during the hay-fever season, as thereby they avoid to some extent the specific irritant (pollen), as well as the aggravating influences of light, heat,

and dust. The proximity of hay-fields should of course be avoided. Cotton-wool plugs for the nostrils, and spectacles with accurately-fitting gauze guards, have been found to afford to the wearer considerable immunity from the complaint.

Many internal remedies have been recommended. As a general rule these patients exhibit some degree of nervous irritability, or neurasthenia, which requires to be treated on the usual lines. Apart from this, however, certain drugs have acquired more or less reputation in the treatment of hay-fever. Quinine is sometimes useful. It should be given in full doses, and, if possible, should be commenced before the attack, and continued till near its close. Arsenic is also useful, and is best given in full doses of the liquor sodæ arseniatis, before and during the attack. Antipyrine has recently been well spoken of. Iodide of arsenic, valerianate, and phosphide of zinc, belladonna, nux vomica, bromide, and iodide of potassium have been found of service in different cases. Morell Mackenzie recommends five or six drops of tincture of opium twice a day, as being effectual in diminishing sneezing and reducing secretion. Hypodermic injections of morphia, administered daily, will give relief to all the symptoms of hay-fever, and will, indeed, sometimes afford complete immunity from the malady, but, of course, it is a line of treatment not to be lightly entered upon.

When asthmatic symptoms predominate in the attack, the administration of ten grains of iodide of potassium, with four or five drops of liquor sodæ arseniatis, three times a day, will sometimes give speedy relief. All the ordinary asthmatic palliatives, such as nitre fumes, medicated cigarettes, Himrod's powder, etc., will be found more or less serviceable in hay-asthma.

Inflammations and excoriations of the lips and margins of the nostrils may be treated with bland ointments, such as

those containing subnitrate of bismuth or oxide of zinc. The itching and burning of the eyes are sometimes relieved by the application of very mild astringent lotions, containing acetate of lead or sulphate of zinc. A drop of a two or four per cent. solution of hydrochlorate of cocaine, placed in the eye, relieves the burning and itching in a rapid and remarkable manner, but the effect usually soon passes off.

Many different remedies have been employed for direct application to the nasal passages in hay-fever. Cocaine, having a benumbing effect on the terminal sensory nerve filaments, and a decided power of producing ischæmia, might be expected to relieve the symptoms. A spray containing a four per cent. solution of hydrochlorate of cocaine, or, still better, the direct application with a brush of a stronger solution, will be found to afford immediate relief. Occasionally the relief will be found to last a considerable time, perhaps for the remainder of the day. More often, however, the effect is transitory, and the application needs frequent repetition. It is doubtful whether such frequent repetition does not, in the end, lead to a greater tendency to vascular dilatation, and increased irritability. Moreover, toxic effects may be set up in certain individuals by the frequent application of the drug. Hence menthol, which has a somewhat similar action on the mucous membrane to cocaine, is recommended as a better application. A ten or twenty per cent. solution in rectified spirit may be painted or sprayed on the mucous membrane, or a little cotton-wool soaked in a ten per cent. solution in olive oil, may be inserted into the nostrils. It must be confessed, however, that menthol is far inferior to cocaine in the relief afforded, and its application sometimes causes pain and smarting, which is never the case with cocaine.

A spray of rectified spirit, diluted with two or three parts of water, is also said to relieve the symptoms of hay-fever. Other local applications which have been said to relieve a

times, are a solution of sulphate of quinine, two to twelve grains to the ounce of water, equal parts of sulphurous acid and water, and carbolic acid solution, of a strength of one in sixty. Beverley Robinson recommends painting the nasal mucous membrane with a solution of carbolic acid in three parts of glycerine. Sir Andrew Clark recommends the following formula:—Glycerine of carbolic acid, an ounce; hydrochlorate of quinine, sixty grains; perchloride of mercury, a fifth of a grain. This he directs to be applied with a brush passed along the floor of the nose to the nasopharynx. He finds two or three applications of the kind will sometimes suffice to cure a paroxysm for the season, but the immediate effects may be very irritating.

The most important thing, however, in every case of hay-fever, is to make a careful examination of the nasal passages, so as to undertake the treatment of the pathological conditions, which, as already stated, are very frequently found associated with the malady, and the removal of which may eradicate the complaint. Mucous polypi, if present, must be removed. Redundant tissue, erectile or otherwise, is to be destroyed with the galvano-cautery. Marked deviations of the septum may have to be corrected, and septal out-growths removed. Hyperæsthetic areas are to be sought out, and the surface destroyed with the galvano-cautery or chromic acid. By pursuing this plan of treatment the best results have been obtained in the direction of a radical cure. The treatment requires, however, to be carried out with much patience and perseverance. It may be undertaken during an attack, but is best pursued during the interval of freedom, and the patient must be kept in sight till the next season, so as to discover what benefit has been derived, and whether further local treatment is required.

Intra-nasal treatment is not to be neglected because no gross pathological changes are present, for, since the attack

is immediately determined by the application of an irritant (pollen) to the nasal mucous membrane, any treatment which has been found to destroy the irritability of the mucous membrane, such as the destruction of hyperæsthetic areas with the galvano-cautery, is rational. Moreover, measures which effect a permanent constriction of the cavernous tissue on the inferior turbinate bodies will tend to eliminate one element in the production of symptoms, and will mitigate the severity of the attack, though the susceptibility to the complaint may remain.

It must be remembered that even where local treatment is most strongly indicated, a prolonged course of general treatment with nervine and other tonics may be desirable.

XVII.

PROFUSE WATERY DISCHARGE FROM THE NOSE.

CASES are sometimes met with, which evidently belong to the class already spoken of under the designation of Nervous or Periodic Coryza, in which the prominent symptom is an extraordinarily profuse watery discharge from the nostrils. The discharge generally occurs periodically, being ushered in by a sense of formication in the bridge of the nose, or of itching or irritation in the nose, followed by some sneezing. The serous discharge may run in drops, or even in a stream, from the nose for several hours. One or more such attacks may occur in the twenty-four hours. In some cases the discharge has continued for days or weeks almost continually, though with remissions and exacerbations. The malady may thus persist in a more or less aggravated form for months or years. It may cease suddenly without apparent cause, and may recur again after a variable interval.

In a case recorded by Althaus a very profuse acrid discharge from the nostrils was consequent on complete paralysis of the fifth nerve on each side.

Quite apart from these cases, however, there have been recorded from time to time instances of profuse watery discharge from the nose, almost invariably from one nostril only, not accounted for by any obvious derangement in the nose, and not attended with any symptoms which would tend to place them in the preceding categories. The discharged

fluid is described as being clear and colourless, and has varied in quantity in different instances, flowing drop by drop or in a stream, and amounting in one case, Elliotson's,* to two or three quarts a day.

The source of this fluid has been the subject of much speculation. It is probable that the source was not the same in all the cases. In some there was a definite history of head injury, and it is likely that in these cases, or some of them at all events, there was a fracture of the cribriform plate or base of the skull, and that there was escape of subarachnoid fluid. In one case reported by Vieusse,† in which there was a discharge from the left nostril and left ear, the existence of a fracture was verified *post mortem*. In one of Priestley Smith's‡ cases there was a polypus in the corresponding nasal fossa, and in Paget's§ case mucous polypi were found *post mortem* in the corresponding antrum. It is hard to imagine that the polypi can have been in either of these cases the cause of the watery discharge.

In many of the cases it was observed that holding the head forwards caused a sudden increase in the flow. The discharge varied in amount, in the same case, at different times, and, after persisting for a variable period of weeks, months, or years, it sometimes completely ceased. Occasionally, after it had ceased, perhaps for some years, recurrence of the flow was observed. Analysis of the fluid, in several instances, has shown it to be alkaline, with a specific gravity ranging from 1003 to 1008, and containing chlorides, and some albuminous matter. In some cases sugar was noted as being present, in others it was absent.

In most of the reported cases there were more or less marked cerebral symptoms, at one time or other. In some

* *Medical Times and Gazette*, September 19, 1857.

† *Gaz. Hebdomadaire de Med. et Chir.*, 1879, No. 19.

‡ *Ophthalmic Review*, 1883 (Record of two cases).

§ "Clinical Society's Transactions," 1879.

cases symptoms of cerebral compression were visible at the onset, and were relieved when the flow commenced, to recur again when the flow temporarily ceased. Headache, drowsiness, vomiting, or convulsive symptoms are frequently mentioned as accompanying a diminution or cessation of the flow. In some cases, such as Priestley Smith's, Nettleship's* and Leber's,† optic neuritis, usually double, and going on sometimes to total blindness, was present. Anosmia was noted in Nettleship's and Leber's cases. Death occurred with cerebral symptoms in several of the recorded cases.

It is hard to resist the conclusion that in many of these cases the discharge was subarachnoid fluid, which found its way into the nose in some manner or other. It is true that post-mortem examination, which was made in some of the cases, in which for various reasons this seemed the probable source, did not reveal any communication by which the fluid could have passed into the nose. Nevertheless, as Berger and Tyrman suggest, the fluid may have passed through the lymphatic channels, described by Axel Key and Retzius, which surround the filaments of the olfactory nerve, as they perforate the cribriform plate.

* *Ophthalmic Review*, 1883.

† Gräfe's "*Archiv.*" xxix. 1, p. 273.

XVIII.

ADENOID VEGETATIONS OF THE NASO-PHARYNX.

REFERENCE was made, in the description of the naso-pharynx, to the abundance of adenoid tissue in that region. It is the overgrowth of this tissue which constitutes the disease known as adenoid vegetations. The disease therefore affects the roof and upper part of the posterior wall of the naso-pharynx, the site of the mass of adenoid tissue known as the pharyngeal tonsil, and constitutes, in fact, a hypertrophy of the pharyngeal tonsil.

Causation and Nature.—The disease is common, and, like the allied condition in the faucial tonsils, it belongs especially to childhood. Some cases date from birth, and many commence in the first or second year. Most cases commence about three years of age. Adenoid vegetations are met with, commonly enough, up to fourteen or fifteen, after which they are rarer, and become very rare after twenty. When met with at these more advanced ages, the commencement of the affection dates back to childhood. The subsidence and gradual disappearance of the vegetations as age advances are due to atrophy of the lymphoid tissue, and in great measure to the organization of inflammatory products. The disappearance of symptoms is, however, to some extent, due to the increased roominess of the naso-pharynx space, in consequence of which the growths occupy a relatively smaller part of the space.

There does not seem to be a greater prevalence in either

sex. The complaint is more common in delicate than in healthy children, and is commonly associated with enlarged tonsils, and enlarged glands beneath the angle of the jaw.

Inherited syphilis has probably no influence. Catarrhs, and the acute exanthems, especially measles, which lead to catarrhal conditions, are often the starting points of the disease. Cleft palate is usually accompanied by adenoid vegetations, the local irritation caused by contact of food, and cold air, initiating the disease in these cases.

The vegetations grow chiefly from the roof of the nasopharynx, whence they often project downwards in the form of a thick transverse fringe, with antero-posterior indentations of varying depth, having a fancied resemblance to a "cock's comb." Sometimes clusters of cylindrical, conical, or club-shaped projections hang down from the roof like stalactites. On the posterior wall, for some distance downwards, the growths project as rounded prominences, vertical fringes, or pad-like elevations. The vegetations often occupy the fossæ of Rosenmüller, and are grouped round the Eustachian orifices, but it is doubtful, according to the investigations of Trautmann, whether they ever actually grow from the lateral walls, the vegetations occupying the positions just mentioned really proceeding from the lateral parts of the roof and posterior wall. Small vegetations sometimes occur on the upper surface of the soft palate. Sometimes the pharyngeal tonsil projects as a somewhat smooth compact mass, which may have a bi-lobed or tri-lobed form.

The consistence of the vegetations is mostly soft, but sometimes, especially in older subjects, they are somewhat tough. Their colour varies from pale pink to dark red. The structure is similar to that of enlarged tonsils, viz., adenoid tissue, covered, in parts, with cylindrical ciliated epithelium, in parts, with squamous epithelium. They are generally very vascular.

Symptoms.—Adenoid vegetations lead to a series of

symptoms, some of which depend on the impediment to the current of air through the naso-pharynx, others on interference with the movements of the soft palate, and others again on the vascularity and copious secretion from the vegetations, and the catarrh of the neighbouring mucous membrane.

The degree of impediment to the passage of air depends partly on the amount of vegetations, partly on the size of the naso-pharynx. It depends also in some degree on the



FIG. 27.—Adenoid Vegetations. Facial Aspect.

situation of the growths. Thus a small amount, on the posterior wall of the pharynx, may fill up the slit between the soft palate and pharyngeal wall, and cause more marked symptoms than the same amount in another situation.

In young infants noisy breathing, or snoring during sleep, with perhaps suffocative attacks, such as are described in the section on nasal obstruction, will first call attention to the malady. In older children a train of symptoms will be present, varying in degree according to the severity of the case. In a marked case the face is characteristic. The

lower jaw is dropped, and the mouth is kept constantly open. The folds between the nose and upper lip are obliterated, the inner canthi of the eyes drawn down, and the eyebrows elevated. The expression of the face is vacant, listless, or even stupid. The nose is narrowed and pinched from side to side from long-continued inactivity.

Children with adenoid vegetations breathe noisily, especially when eating or drinking. They sleep with the mouth open, breathe noisily, and snore. Their sleep is usually broken and disturbed, they toss about restlessly in bed, moan and talk, and night terrors are common. A constant hacking or barking cough is a common symptom, quite independently of any bronchial complication, and this cough is often chiefly or solely troublesome for some hours after going to bed.

The voice has a peculiar dead character. It lacks the natural resonance, and there is inability to pronounce the nasal sounds *m*, *n*, and *ng*, and the *l* and *r* sounds are muffled. Stuttering, according to Freudenthal, may result from adenoid vegetations. Deafness is very frequently present, varying in degree, transient or permanent. Attacks of earache and otorrhœa are common. Ear troubles are due to propagation of catarrh to the tympanic cavity, or to blocking of the Eustachian orifices by vegetations. The ventilation of the tympanum may be further impeded by the interference with the movements of the soft palate, and with the full action of the muscles which dilate the tubes.

Besides their deafness, which interferes with progress at school, these children are not uncommonly dull in intellect, and often suffer from irritability of temper and headaches. They are often ill-developed and backward, physically as well as mentally.

There is usually a semi-purulent secretion from the nasopharynx, which trickles down the back of the pharynx, and the child is very subject to nasal discharge. In the morn-

ing there will often be a discharge of blood-stained mucus on the pillow, or blood may be noticed in the mouth or on the lips. Occasionally a little blood will be hawked up in the daytime. The bloody discharge results from the great vascularity of the vegetations. Colds in the head, to which these children are very subject, will aggravate all the symptoms, and in slighter cases the symptoms may scarcely be noticeable, except when the child is suffering from a cold.

Prolonged nasal obstruction and buccal breathing lead to other troubles. Sore throats, chronic pharyngitis, laryngitis, and bronchitis often result. Deformity of the chest is also said to be a common result. Prominence of the incisor teeth, narrowing laterally of the alveolar arch, with a high palatine arch, are frequently seen associated with adenoid vegetations. The frequent association is undoubted, whatever be the explanation. A high arched palate in its turn gives rise to, or at any rate is associated with, deflection of the nasal septum, so that deflected septum and adenoid vegetations very often coexist.

More or less constant dribbling of saliva from the mouth is a symptom occasionally caused by adenoid vegetations, especially in young children. The flow of saliva may be so great as to saturate the child's things several times a day. More often the dribbling occurs principally or wholly during sleep.

Headache is not an infrequent symptom in children with adenoid vegetations. It is usually seated in the forehead.

Although a correct estimate can usually be formed of the nature of the case from the history and symptoms, a certain diagnosis can only be made by means of physical examination. Posterior rhinoscopy and digital palpation are the two methods at our disposal, and, if possible, both methods should be employed. Rhinoscopic examination is often difficult, and sometimes impossible, owing to the age of the

patient, the narrowing of the space between the soft palate and the pharyngeal wall resulting from the vegetations or thickened mucous membrane, and the frequent coexistence of enlarged tonsils. While proceeding to make a rhinoscopic examination the posterior wall of the oro-pharynx should be observed, and it will often exhibit rounded or irregular red elevations, outgrowths of adenoid tissue in this region. Tracing up the posterior wall in the rhinoscopic image, similar red elevations will be seen on the posterior pharyngeal wall, above the level of the margin of

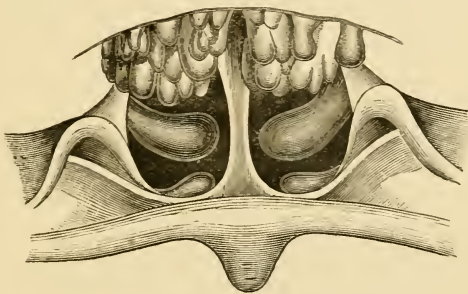


FIG. 28.—Adenoid Vegetations. (After Butlin.)

the soft palate. If the choanæ are now brought into view, the upper arched portions will be broken, or partly or wholly concealed by projections from the roof (Fig. 28). Other vegetations may be seen at the sides of the space, or around the Eustachian orifices. If the naso-pharynx be much crowded with vegetations the natural structure cannot be distinguished, and only a confused reddish mass will be seen, or at most a narrow slit will be discovered between the adenoid mass and the soft palate, across which a layer of mucus will often be seen extending. At best only an imperfect idea of the shape and depth of the various folds and elevations can be obtained, owing to the effects of

foreshortening in the image, and the close manner in which the vegetations are packed together.

After making a rhinoscopic examination, or in cases where such examination is impossible, the finger should be passed up behind the soft palate in the manner described at page 41. This can very easily be done, even in young children. The choanæ, roof, posterior wall, and sides of the cavity should be rapidly explored. When the vegetations are very large and abundant the finger will often seem to break through a soft, friable mass as it is passed up to the roof, or a feeling as if the finger were thrust into "a bunch of earthworms" may be experienced. Separate, soft, movable vegetations may be felt, or numerous small vegetations and folds may give to the mucous membrane an irregular velvety feel. Less frequently, a firm, more or less compact, projecting mass may be felt stretching transversely across the roof, and projecting downwards to a greater or less extent, caused by a more uniform hypertrophy of the pharyngeal tonsil. Owing to their softness and vascularity, the vegetations will usually bleed when touched, and the finger, when withdrawn, will be found smeared with blood.

On examination of the pharynx in a case of adenoid vegetations, the tonsils will be frequently found enlarged. Some doubt may arise as to whether thickness of speech, deafness, snoring, and other symptoms, may not be due to the tonsils alone. Although enlarged tonsils do not produce the characteristic "dead" character of voice, nor as a rule so completely impede nasal respiration as adenoid vegetations, still, in doubtful cases, the effect of excision of the tonsils will clear up the diagnosis. A marked immobility of the soft palate, which hangs forwards at a considerable distance from the pharyngeal wall, will often be noticed in adenoid cases.

Swelling, and hypertrophic conditions of the mucous membrane of the nose, a distension of the cutaneous vein across

the root of the nose (*Spicer*), as well as thickening of the skin on the nose and upper lip, are said to result from adenoid vegetations.

Although adenoid vegetations tend, with the approach of adolescence, to diminish and disappear, they constitute, during childhood, a constant source of danger and trouble, and not unfrequently inflict permanent mischief. Not only do they predispose to inflammatory affections of the pharyngeal and respiratory passages, but children affected with adenoid vegetations are less able to cope with diseases in which these parts are implicated. Diphtheria, scarlet fever, measles, whooping-cough, and other diseases, are apt to assume a more severe type in these children.

Deafness, mouth-breathing habit, and imperfect resonance of voice, as well as the characteristic expression of face, will often remain as permanent effects of the impairment of function due to adenoid vegetations in childhood, even though the vegetations themselves may have more or less completely disappeared. The collapsed state of the *alæ nasi*, and wasted condition of their muscles, resulting from long disuse, sometimes contribute to the perpetuation of the mouth-breathing habit. On the other hand, the rapid disappearance of all the symptoms, after a timely removal of the growths, is very striking.

Treatment.—Internal remedies appear to have no direct influence in causing the decrease or disappearance of adenoid vegetations. The general condition of the patient is, however, frequently such as to indicate the administration of cod-liver oil and iron.

An alkaline lotion (formulæ 1, 2), applied with douche, syringe, or spray, will sometimes improve the catarrhal condition of the mucous membrane, and give some relief; but once the diagnosis has been established it is best to proceed to the destruction or removal of the growths with as little delay as possible.

In mild cases the application of solid nitrate of silver, or the mitigated stick, to the surface, once a week or so, for several weeks, is said to effect a cure. The application can be made with a slender curved caustic holder, or the nitrate of silver can be fused on the end of a bent probe. The application should be directed with the rhinoscopic mirror. The electric cautery is sometimes used for the destruction of the vegetations. A suitably curved electrode is passed through the mouth, behind the soft palate, and the point guided to the part with the mirror.

Some method, however, by which the vegetations are nipped off or scraped away is almost universally employed. A large number of instruments have been devised for the removal of these growths, and in this, as in other operations, each operator no doubt works best with the instrument he habitually employs. A sharp forefinger-nail is preferred by some operators to any instrument, and no doubt soft vegetations, if not very abundant, may be easily scraped away with the finger-nail.

Whatever method be employed, the operation may be performed without or with an anæsthetic. In the former case, as a rule, the growths can only be removed at several sittings; in the latter, the naso-pharynx can be thoroughly cleared out at one sitting. The latter is the better plan, and indeed in children it is usually impossible to operate satisfactorily without an anæsthetic.

One of the most satisfactory instruments for removing adenoid vegetations is Loewenberg's forceps, especially the form as modified by Woakes (Fig. 29). In the case of older and more tolerant subjects, the patient may be seated in front of the operator, and the instrument may be passed up behind the soft palate, guided by the rhinoscopic mirror or the forefinger. More often, instead of the mirror or guiding finger, a previous careful inspection or palpation of the situation and extent of the vegetations must be trusted

to in order to seize and remove them. Young children must be held securely in a nurse's arms and the mouth kept open with a gag held by an assistant.

It is far better, however, as a rule, to use an anæsthetic. Chloroform is most convenient, especially in the case of young children. When chloroformed, the patient may lie in the ordinary recumbent position, or the head may be made to hang down over the end of the table. The mouth being kept open with a gag, the forceps is passed carefully up behind the soft palate. The vegetations are seized and removed piece by piece, the proceeding being guided, as far

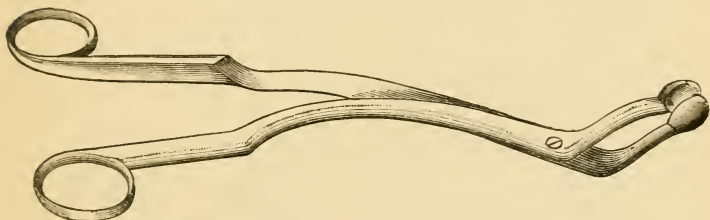


FIG. 29.—Woakes's modified Loewenberg's Post-nasal Forceps.

as possible, throughout, with the left forefinger in the nasopharynx. The back of the mouth and pharynx must be sponged out frequently, as the bleeding is always profuse. The operation is somewhat facilitated by tying the soft palate forward by means of a piece of string or india-rubber tubing, passed through the nose, as described at page .

Some operators, who employ ether in preference to chloroform, recommend the patient to be raised up to a sitting posture for the operation, the head being a little flexed to induce the blood to flow forward out of the mouth.

There are very many forms of post-nasal forceps, differing, however, from one another mostly in slight details. Schütz's forceps (Fig. 30) is peculiar in having rather wide cutting blades which open antero-posteriorly. It is, I think, best

adapted for cases with more or less uniform enlargement of the pharyngeal tonsil.

Besides post-nasal forceps, many instruments have been devised for removing the vegetations by a scraping process. Meyer's ring knife (Fig. 31, B) is used by some operators. It is the oldest instrument, being that employed by Meyer, of Copenhagen, who first drew attention to the disease. It is passed through the nostril, and the ring is guided by the left forefinger in the naso-pharynx. The ring is worked

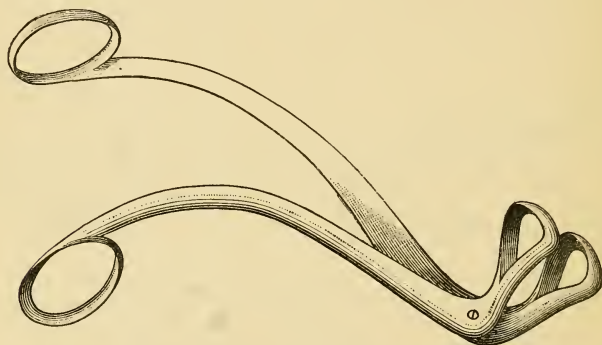


FIG. 30.—Schütz's Post-nasal Forceps.

from above downwards, and made to scrape away the vegetations, the point of the forefinger acting as a *point d'appui* against which the edge of the ring works. The operation can usually be completed through one nostril, the wider being selected. This instrument is recommended by Butlin, to be used in conjunction with the post-nasal forceps, to remove vegetations which may not be easily seized with the forceps.

Another form of ring knife is that of Hartmann's (Fig. 31, A). It is introduced through the mouth like the post-nasal forceps. When it reaches the roof of the naso-pharynx

the vegetations are removed by a scraping movement from side to side. Three sizes are made, in order to suit the size of the cavity.

Trautmann's sharp spoon (Fig. 31, c), is another instrument employed by some operators for the purpose of scraping away adenoid vegetations.

The finger can be used in conjunction with any of these instruments, for the removal of small vegetations or any loose tags that may be left behind. A few operators employ an artificial fingernail made of steel, which is fitted on the forefinger, and with which vegetations can be scraped away. It is not, however, a very satisfactory method.

In every operation for removal of adenoid vegetations sharp bleeding must be expected, but this very quickly stops after the operation is complete. If the operation has been at all extensive, it is desirable for the child to keep in bed for a few days, and to observe care, for a week or ten days, against catching cold, lest middle ear inflammation or other trouble occur. No local after-treatment is really necessary. Some opera-

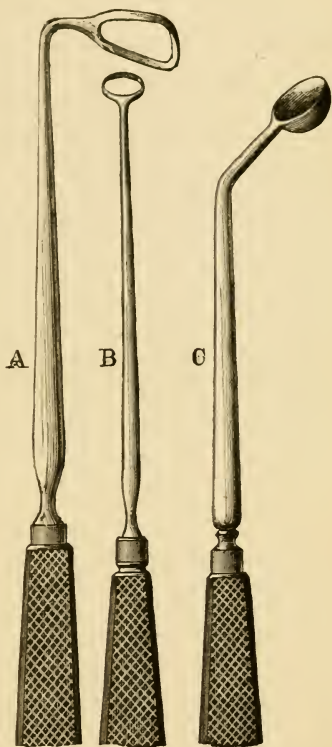


FIG. 31.—A. Hartmann's Ring Knife.
B. Meyer's Ring Knife.
C. Trautmann's Sharp Spoon.

tors, however, use a mild disinfecting lotion to the nasopharynx, once or twice a day, for a few days.

The result of the removal of adenoid vegetations is usually most satisfactory, especially in young children. Nasal respiration is re-established, the mouth is no longer kept open, and the expression of the features is changed for the better. The voice regains its natural resonance, sleep is quiet and tranquil, and the intellect and general physique often undergo remarkable improvement.

Once thoroughly removed, adenoid vegetations do not recur. When, as sometimes happens, a second operation is required, this is due to small vegetations having been left behind, which swell up on removal of the pressure from surrounding masses. It is sometimes advisable, after the operation, to give directions that the patient be encouraged to breathe with the mouth shut, in consequence of the mouth-breathing habit having become inveterate.

XIX.

MORBID GROWTHS.

THE commonest morbid growth in the nasal passages is the ordinary soft, gelatinous polypus, or mucous polypus, to which the term nasal polypus is now generally confined. Much more rarely growths of nature of papillomata, fibromata, sarcomata, and carcinomata are met with, as well as those of a cartilaginous and osseous character. The ordinary mucous polypus, occurring as it does more frequently than all the other morbid growths put together, is the only one that will need detailed description in a work of this scope.

1. MUCOUS POLYPI.

Causation and Nature.—Mucous polypi are more common in men than women. They occur chiefly in young adult life, being rarely met with before the age of fifteen, and not often beginning in advanced life. The exact causation of these growths is doubtful. It is very probable, however, that repeated inflammatory attacks, and chronic nasal catarrh, tend to their development. They are very often associated with hypertrophic conditions, especially of the middle turbinate body. The anterior and lower portion of the body is often enlarged in cases of mucous polypus, so as to completely fill the middle meatus. Woakes* holds that polypi always result from a chronic inflammatory pro-

* "Necrosing Ethmoiditis." London. 1887.

cess of the muco-periosteal investment of the spongy bones, associated with a morbid condition of the bone itself closely allied to caries, which he terms *necrosing ethmoiditis*. This view, however, has not received support from any other quarter.

Nasal polypi are usually multiple, and are found simultaneously in both nasal fossæ, in about half the cases met with. They vary in size from a grain of wheat to a grape, but may attain the size of a chestnut, or even greater dimensions. They are of a pearly-grey, or greyish-yellow colour, and have a smooth, glistening, translucent appearance. They are of soft consistence, and if cut across a quantity of thin fluid oozes out, by which the size is much reduced. They are globular or pyriform in shape, and usually hang loosely from the nasal wall, being attached thereto by a narrow pedicle. Some are, however, sessile, and attached by a more or less broad base. As they increase in size they are moulded by the surrounding parts, and may assume very elongated or flattened forms.

Mucous polypi grow from the mucous membrane, and are composed of the elements of the mucous membrane more or less altered in character. They are not exactly true myxomata, but belong rather to the class of soft fibromata (*Hopmann*). They have an investment of ciliated epithelium, and are supplied with bloodvessels, which may be seen ramifying, especially near the pedicle. They are devoid of nerves. The structure of the tumours consists of a delicate network, formed by interwoven bands of connective tissue, the interstices of which contain an abundance of fluid rich in mucin. In this fluid are suspended numerous round cells, and sometimes those of a fusiform or stellate form. The consistence of polypi varies with the degree of development of the connective tissue stroma, which is usually extremely sparse and scanty, but is most developed near the pedicle. Glandular structures similar to those of the nasal

mucous membrane can be traced from the surface inwards. These are sometimes swollen into bladder-like bodies, filled with mucus, constituting cysts of various size.

Mucous polypi spring almost exclusively from the outer wall of the nasal fossæ. By far the commonest apparent origin is the middle turbinate body, especially the anterior part, but, as Zuckerkandl's researches on the dead subject have shown, many of these growths have really a deeper origin in the middle meatus, the edges of the hiatus semilunaris, and the infundibulum being favourite sites. They sometimes spring from the upper meatus, the upper turbinate body, and sometimes also from the inferior turbinate body. They very rarely indeed grow from the septum. Sometimes a polypus is attached at several points, but this is the result of friction, with subsequent cicatricial adhesion. As they increase in size they project forwards into, or even beyond, the anterior nares. When growing from the posterior part of the fossa, they may project into the nasopharynx, and being there free to grow, they often increase rapidly, and, acquiring a long pedicle, hang down into the pharynx. Such polypi, springing from the posterior part of the fossa, are usually single, and of a firmer consistence than ordinary polypi, owing to their containing a larger proportion of connective tissue.

Symptoms.—The symptoms of nasal polypi are due partly to the obstruction produced by the tumours, partly to the direct mechanical pressure and irritation they produce, and finally to reflex irritation in parts outside the nasal cavity.

The early symptoms are similar to those of chronic rhinitis, and most patients for a long time believe a "chronic cold" to be their only trouble. They complain of stuffiness in the nose, on one or both sides, which they endeavour to relieve by frequent snuffing or blowing. A sense of fulness in the frontal region may be felt. There is increased secre-

tion, mostly of a thin watery character, and this may be partly discharged backwards into the naso-pharynx. A tendency to attacks of sneezing may be present. The stuffiness is increased in damp weather, which causes the polypi to swell up from absorption of moisture. Sometimes the tumour can be felt flapping to and fro with respiration, and either inspiration or expiration may be chiefly impeded by its valve-like action.

As the disease progresses the nasal passage, or passages, become completely occluded, the patient breathes partly or wholly through the mouth, the senses of taste and smell are blunted, and the voice acquires the characteristic intonation of nasal obstruction. Deafness may be present from associated catarrh of the Eustachian tubes, or from the direct pressure of the tumours when they project into the naso-pharynx. Very rarely the tear duct is pressed upon, and epiphora or lachrymal abscess results.

If allowed to increase, the tumours often make their appearance at the anterior nares, and cause distension of the cartilaginous nose. They rarely produce distortion or absorption of the walls of the nasal fossæ, their soft consistence rather causing them to adapt themselves to the surrounding parts. Nevertheless, in advanced and neglected cases, deformity of the nasal chambers has occurred, and the bones of the face have been distorted, and the contents of the orbit displaced.

Of the reflex complications, bronchial asthma is the most important. Of the frequent association of asthma and nasal polypi there can be no doubt whatever, and all who have had opportunities of seeing such cases have often observed the cure of the asthma follow removal of polypi. Without any bronchial implication, a reflex cough may result from nasal polypi, but it must be remembered that cough associated with polypi may result from mucous trickling back into the larynx. Susceptibility to hay-fever, or some

allied form of nervous coryza, is sometimes developed in consequence of nasal polypi. Other symptoms of the class of reflex neuroses, which have been observed from time to time to result from nasal polypi, are headache, supra-orbital neuralgia, migraine, giddiness, and epilepsy.

Polypi are generally readily seen from the front. If numerous and projecting forwards, they may be seen by simply tilting up the tip of the nose, but a speculum and good light are mostly necessary. Cocaine, which constricts the parts and opens up the view, will often aid the diagnosis. A probe to push aside any swollen mucous membrane will sometimes help. The pale, semi-translucent appearance of the growths, and their softness and mobility, as ascertained with a probe, will readily distinguish them from all other growths, or conditions, which give rise to nasal obstruction. Fibrous, sarcomatous, and malignant growths, while wanting the above characters, bleed easily when touched. Cartilaginous and bony growths are hard, dense, and fixed. A deviated septum could not be mistaken for a polypus, if both nasal cavities were carefully examined, a proceeding which should always be followed. The condition most likely to be mistaken for polypus is an erectile swelling on the anterior part of the inferior turbinate bone. These swellings are sometimes very pale and indent very readily with a probe. Moreover, they often coexist with nasal polypi. However, the situation, and the absence of pedicle, and the gradual blending of the swelling with the inferior turbinate body, serve to distinguish these swellings from polypi. They subside rapidly on the application of cocaine solution, and sometimes diminish while we are examining, without any application. Hypertrophic swellings and outgrowths of the mucous membrane, especially on the inferior and middle turbinate bodies, sometimes freely movable, and pedunculated, may simulate polypi, but their red colour, firmer consistency, and absence of translucency, serve to distinguish them.

When a polypus projects into the naso-pharynx, posterior rhinoscopy, and digital palpation, are needed to make the diagnosis. Sometimes a large polypus may be seen from the mouth hanging down from behind the soft palate. Erectile swellings at the posterior ends of the inferior turbinate bodies have to be distinguished from polypi, like the same condition in front.

Treatment.—Various methods are employed for the removal of nasal polypi, and each method has its advocates. While some of these are, for general use, much inferior to others, there is, perhaps, none which is not specially adapted to particular cases, and every operator should be prepared to use any method suitable to the case in hand, though he will naturally favour for general use the method in which practice has given him most skill. I am satisfied myself that some form of snaring is the most scientific and efficient mode of removal, and also that which is most agreeable to the patient.

Before operating, there are certain general points to be attended to whatever method be used. In the first place, a careful study of the position, size and attachment of the growth, or growths, should be made with good illumination and the use of the probe. In the second place a ten or twenty per cent. solution of cocaine should be applied with a brush, as far as practicable, to the lining membrane of the nasal cavity. This will diminish the pain, and will afford more room for manipulation, by reducing vascular swelling of the mucous membrane. It will also lessen the tendency to bleed.

The Forceps is still probably the most widely employed instrument, though it has of late years been condemned by many authorities on the subject (*Voltolini, Michel, Zaufal*, and others). There is no doubt when the forceps is used in the blind and haphazard manner, which was till recently in vogue, it is deserving of the epithets dangerous, brutal,

painful, and inefficient, which have been applied to it. In point of fact instances have been recorded of portions of the turbinate bones having been torn away, of severe hæmorrhage, and of laceration of the ethmoid, with death from meningitis. Still the forceps is a simple, certain, and rapid method of removing polypi, and though more painful than some other methods, is quite safe, if only it be properly used.

The forceps used should be lightly made, with slender serrated blades. The nostril having been well dilated with a Frænkel's or Thudichum's speculum, and the cavity well illuminated, the polypus is to be seized as near the pedicle or base as possible, and removed by twisting the forceps. The rule should be observed to seize nothing which is not seen, and in this way alone can accidents be guarded against. Where the growths are numerous, the introduction of the forceps must be repeated two or three times, the blood being syringed or mopped away, and the cavity carefully inspected after each introduction. Several sittings may be necessary in extensive cases. Polypi, situated far back, may be difficult to seize. A finger may be passed up behind the soft palate in this case, and the forceps thereby guided to the pedicle of the growth.

Some operators use a forceps so constructed as to cut through the pedicle instead of having to twist off the growth. There is no doubt, however, that twisting off effects a more complete removal of the pedicle, and diminishes the liability to recurrence.

The Wire Snare is now used by many operators, probably by all specialists, and though its skilful use requires some practice, it may be safely affirmed that it does not require more practice than does a safe and skilful use of the forceps. Two essentially different kinds of wire snare are in use, viz., the cold wire snare and the galvano-caustic snare.

There are many forms of **cold wire snare** sold. It is

important to have one of slender and light make. Blake's snare (Fig. 32) is a simple and handy form. The handle is fitted with three rings, one at the extremity for the operator's thumb, and the others destined for the index and middle fingers by which the loop is tightened. The latter should have a free play on the handle of at least two inches. The tube containing the wire must be at least four inches long. Many of those sold are too short. The end of the

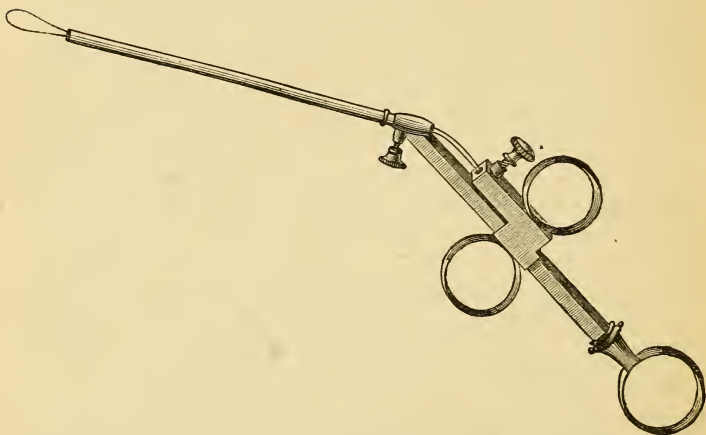


FIG. 32.—Blake's Nasal Polypus Snare.

tube should be fitted with a cross bar to prevent the loop being drawn into the tube. Thin piano wire (No. 5) is the best kind to use, on account of the resiliency of the loop.

In examining the nares prior to operating, so as to determine the position and origin of the growth, it must be borne in mind that by far the larger majority spring from the middle turbinate body and its vicinity. Having dilated the nostril with a speculum, preferably a self-retaining one, and thrown in a good light, the wire loop, previously adjusted according to the size of the polypus to be seized, is intro-

duced in a vertical position, and then gradually turned to a horizontal one, so as to pass under and encircle the growth. The loop is then pushed upwards and outwards around the growth, so as to engage it as near the base as possible, and the instrument is kept pressed at this point, while the loop is slowly tightened. The base of the polypus is sometimes cut through, especially with instruments which allow the wire to be drawn into the tube for any distance. This, no

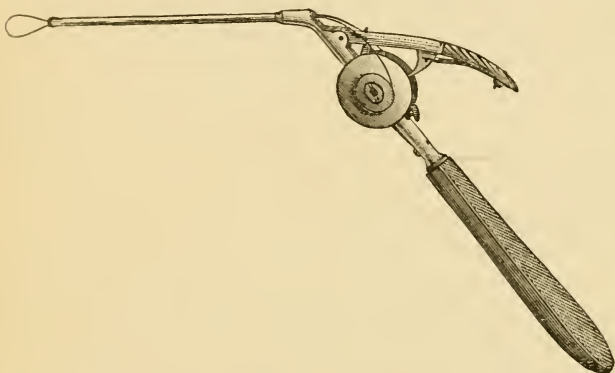


FIG. 33.—Mackenzie's Wire Ecraseur.

doubt, is more easy and painless, as well as more bloodless ; but it is better, when the polypus is seized, to tear it away, as thereby the base of the growth is more completely removed, and recurrence more satisfactorily guarded against. One should endeavour to seize one polypus only at a time. If at any time a polypus, or a portion of mucous membrane, be seized which will not yield to traction of moderate force, the wire should be released at the handle, and the loop drawn out of the tube. The above proceeding is repeated till several or all the growths are removed, the blood, which will usually be less abundant than with the forceps, being

mopped or syringed away, and the cavity carefully inspected from time to time. Several sittings will be necessary to clear the nasal cavities in bad cases.

When a polypus is far back and projects into the post-nasal space, or hangs down into the pharynx, considerable ingenuity may be called for to pass the loop round it, especially if the tumour is large and blocks the posterior nares. A finger, carried up behind the soft palate, may assist, or it may be necessary to push the loop through the nose, with a suitable instrument, till it is well behind the tumour. For the removal of these polypi, arising far back, and possessing rather firm pedicles, Jarvis's snare (p. 80), or Mackenzie's wire *écraseur* (Fig. 33), will be found well adapted. The galvano-cautery snare is, however, perhaps the best means of dealing with polypi with thick, firm pedicles.

The **galvano-cautery snare** is preferred by many operators before every other method for the removal of nasal polypi. Owing to the necessity of having a battery, it perhaps cannot become so general as the cold snare; nevertheless, since the galvano-cautery is the best means of destroying the remains of the pedicles, and the diseased mucous membrane from which the polypi grow, and is therefore essential for proper after-treatment of most cases, those who are called on to treat many such cases cannot well dispense with a battery.

The snare should be fitted with a loop of steel wire (No. 6 or 7 piano wire). This is preferable to platinum wire, on account of its resiliency. The loop is applied in the same manner as the cold snare. As soon as the loop is tightened the current is turned on, and the base of the polypus burned through. If care be taken that the wire shall be put at a dull red heat the hæmorrhage is almost nil. If properly employed this method is as painless as any, and is freer from hæmorrhage. It cannot be denied, however, that the

polypus is rarely if ever removed so as to leave no part of the pedicle. The removal is not as complete as when, by means of the cold snare, the polypus is torn away from its attachment. The smallness of the hæmorrhage is claimed as an advantage, but the hæmorrhage rarely amounts to much with the cold snare, and the latter is a much handier instrument to manipulate. I formerly used the galvano-cautery snare almost exclusively, but I have latterly given it up in favour of the cold snare.

Instead of the galvano-cautery loop, the flat, spatula-like electrode is sometimes recommended for the treatment of polypi. This is passed along the surface of the mucous membrane against the base of the polypus. This method is, however, not satisfactory.

Caustics and Astringents have been used to destroy polypi, but the method is inferior to others, and is rarely used. Donaldson,* of Baltimore, recommends chromic acid in a concentrated solution, smeared on a pointed glass rod, to be passed into the substance of the polypus. This causes the tumour to shrivel up. He advises painting the mucous membrane, previously, with liquor plumbi to protect it from the acid. Dr. B. W. Richardson recommends sodium ethylate for the treatment of polypi. He applies a small plug of cotton-wool, saturated with sodium ethylate, to the pedicle for some minutes. On withdrawing the plug the polypus is ejected by blowing the nose. The stumps may be further treated by applying the same remedy to them.

Whatever method be employed for removing polypi, however good a clearance we make at the first sitting, we may expect, in many cases, to find polypi of some size present, a few days later. This, of course, is not due to a recurrence of the disease, but merely to the fact that polypi, which have been pressed out of sight by other growths, swell up and become prominent, on the removal of pressure. The amount

* "Archives of Laryngology," Vol. III. p. 178.

that can be accomplished at each sitting varies much according to the nature of the case, the amount of hæmorrhage, and the tolerance of the patient. It is, therefore, usually impossible to predict exactly the number of sittings which will be necessary, in any given case.

After-treatment.—After removal of all the growths, there will remain the important question as to how we are able to prevent the recurrence of the disease. In considering this we must bear in mind three things: Firstly, a polypus of which some portion or stump remains will usually grow again; secondly, there are often, in addition to the polypi of sufficient size to remove by the ordinary methods, small commencing buds, which will develop if left alone; and, thirdly, the diseased condition of the mucous membrane on the middle turbinate, and elsewhere, which led to the development of the polypi, may remain to give rise to recrudescence of the diseases. It is often difficult to get patients to see the necessity for further treatment, as the removal of the polypi, allowing a free passage through the nose, gives them a sense of being cured.

The galvano-cautery is the most useful means at our disposal for this further treatment. In some cases, where the polypi are few, and the structures not diseased, the application of the blunt-pointed, or flat electrode to the points of origin of the growths will prevent recurrence. In other cases, where the growths are numerous, and the mucous membrane has a granulating appearance, or where, as is often the case, a large extent of the mucous membrane of the middle turbinate body is covered with small polypus buds, or seems to have undergone, what one may term, a polypoid degeneration, the surface may have to be destroyed, over a considerable extent, with the galvano-cautery, the process being performed at several sittings. Cocaine should of course be used in all such cases.

Instead of the galvano-cautery, a caustic may be used to

destroy the pedicles, or diseased mucous membrane. Chromic acid is well adapted for this purpose. It is best applied in the solid form, a small surface only being treated at a time. Dr. de Havilland Hall recommends pure carbolic acid as being less painful, and as effectual as chromic acid.

When, however, the middle spongy bone is swollen, so as to block up the middle meatus, especially if, as is often the case, it has a granular, fungating appearance, it is advisable to remove a portion of the body. Jarvis's snare, or the galvano-cautery loop, will usually be effectual for this purpose. It may be necessary to transfix the body with a needle

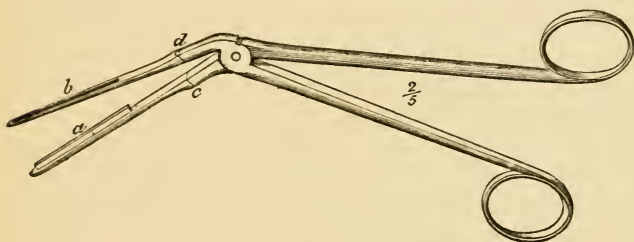


FIG. 34.—Mackenzie's Punch-Forceps.

to keep the loop on. However, with the cautery loop, a good hold can generally be effected by heating the loop when it touches the body, then very slightly drawing the wire, so as to indent the surface, and then heating again. The substance of the bone in these cases is soft, and there is little difficulty in getting through it. In some cases, Mackenzie's punch forceps (Fig. 34) is a convenient instrument for removing portions of the turbinate bone, in other cases Woakes's curved gouge may be necessary.

After removal of nasal polypi, in ordinary cases, it is not necessary to use any local treatment, and the patient can generally pursue his avocations as usual. After more severe procedures, such as extensive cauterization of the mucous

membrane, or the removal of a portion of the turbinate body, the patient will do well to remain in the house, or even in bed for some days, iodoform powder should be insufflated daily, and in a few days, as discharge sets in, a warm alkaline solution should be sprayed into the nostril.

2. PAPILLOMATA.

Papillomatous tumours in the nasal passages are rare. According to Hopmann, they occur most frequently on the inferior turbinate body; but they are met with on the fore part of the septum, the interior of the ala of the nose, and the floor of the inferior meatus. Papillomata occur, therefore, in different situations from mucous polypi. They occur singly or in groups. They have a greyish-white colour, something similar to mucous polypi, but have a much firmer consistence. The surface is usually lobulated, or distinctly wart-like. They are more vascular and bleed more than mucous polypi. Their removal is therefore best performed with the galvano-cautery snare.

3. FIBROMATA (**Fibrous Polypi**).

Tumours composed principally of compact fibrous tissue, and designated fibromata, are rare in the nasal passages. In the nasal cavity proper, indeed, this form of growth is very rare, the common situation being the naso-pharynx, where it constitutes the **naso-pharyngeal polypus**. In the few cases in which it has been met with in the nasal cavity it has been found far back attached to the roof, or upper or middle turbinate bone. In the naso-pharynx it springs from the base of the skull, the basilar process of the occipital, or adjacent part of the body of the sphenoid. According to Grönbech, the tumour always originates from one side or other of the base of the skull, never from the

middle line. It grows from the periosteum, and is firmly connected with the bone by a somewhat broad base.

The structure of these tumours is very firm, and consists of parallel bundles of fibrous tissue, and a few elastic fibres, invested by an extension of the mucous membrane. The tumours are supplied with bloodvessels, which are sometimes of large size, and are especially numerous in the pedicle and towards the surface of the growth. At first rounded or pyriform in shape, the tumour subsequently becomes irregular, sending processes in various directions of least resistance, and it tends to displace and destroy neighbouring parts as it increases. It frequently forms secondary attachments to surrounding parts.

Fibromata occur mostly in young people from fifteen to twenty-five, and cases have been met with in quite young children. They affect males much more frequently than females. Of forty-one cases of naso-pharyngeal polypus collected by Grönbech thirty-six were in males, five in females. These tumours tend to come to a standstill after twenty-five years of age, and they have been known to diminish, or even disappear, after that age.

Symptoms.—The early symptoms of fibrous tumour in the nasal or naso-pharyngeal passages are, some nasal obstruction on one or both sides, together with hyper-secretion, and the occurrence of attacks of epistaxis. As the tumour increases in size complete nasal obstruction, with its results on the voice and breathing, will arise. Pain is usually complained of, and drowsiness or sleepiness is said to be sometimes a prominent symptom. Deafness usually in one ear, dysphagia, and later on dyspnœa will be present. Meanwhile the attacks of epistaxis become more frequent and more profuse, and there is often a purulent and fetid nasal discharge from more or less ulceration of the surface of the tumour.

As the tumour goes on enlarging it sends prolongations in

various directions, and displaces the surrounding structures in its course. Depending on the direction in which the growth takes place, results of various kinds ensue. In its forward progress it displaces the nasal bones and the nasal processes of the superior maxillary bones, producing the facial deformity known as "frog face." Displacement of one or both eyeballs, distortion of the internal parts of the mouth, erosion of the base of the skull, and all the attendant symptoms of pressure in these directions, may arise in the course of a fibrous tumour.

Anterior and posterior rhinoscopy, and especially digital palpation of the naso-pharynx, in the early stage, discover a tumour growing from the vault of the pharynx (in rare cases from the posterior part of the roof of the nose) with firm attachment, of a reddish or pinkish colour, irregularly round or lobulated, smooth, hard, and unyielding, and easily bleeding when touched. As the growth enlarges it is visible in the pharynx, below the velum. Later, the deformities and displacements will render the diagnosis more easy, although, at any stage, the disease is liable to be confounded with sarcoma.

Treatment.—If diagnosed in the early stage, while the growth is still small, a fibrous tumour may be removed by comparatively simple methods; but if it has reached a considerable size, it can only be dealt with by an operation, involving division of the soft palate, or resection of some of the bones of the face. These larger operations are described in surgical works, and need not be dwelt on here. For the removal of most of these tumours, however, especially for the smaller tumours, some form of wire *écraseur*, either the galvano-cautery snare or the cold steel wire *écraseur*, has been found satisfactory and effectual. If the cold wire *écraseur* is used the loop must be tightened very slowly, to avoid hæmorrhage, some hours, if necessary, being occupied in cutting through the mass. The loop may be introduced

through the nose or mouth according to circumstances, and where the whole tumour cannot be engaged at once, the growth may be removed piecemeal at one or several sittings. The stump of the tumour may require repeated applications of the galvano-cautery to prevent recurrence.

Electrolysis is sometimes successful in causing arrest or recession of the growth. This method has been favourably reported on by Bruns, Michel, and also by Voltolini,* who has introduced some special improvements in this method. Inasmuch as these tumours tend to undergo arrest or recession after twenty-five years of age, any treatment, operative or electrolytic, though only partially successful, may carry the patient on to the time when recession of the growth may be hoped for.

4. CARTILAGINOUS GROWTHS.

Cartilaginous outgrowths, or thickenings, are not uncommon on the anterior and lower part of the septum, being generally attached by a broad base to the septum or adjoining parts of the floor of the nose. A common situation is the line of attachment of the septal cartilage with the maxillary crest and the margin of the vomer. Such outgrowths, or thickenings, are often associated with deviation of the septum.

These outgrowths may be removed with the knife or scissors, or with Bosworth's nasal saw (Fig. 37), if their removal be indicated, on account of obstruction to nasal respiration, or otherwise.

Cartilaginous tumours (**Enchondromata**) have been occasionally met with in the nose, springing usually from the cartilaginous septum, much more rarely from the outer wall or roof. They occur mostly in young people. When

* "Die Krankheiten der Nase, und des Rachenraumes." Breslau, 1888.

present, the tumour gives rise to nasal obstruction and muco-purulent discharge, and if it attain a large size may lead to great deformity through displacement of the neighbouring parts.

When small, these tumours may be removed by the knife, gouge, chisel, or by the wire *écraseur*, or galvano-cautery snare through the nasal openings. Larger tumours will require the nose to be laid open before removal can be effected.

5. OSSEOUS GROWTHS.

Exostoses, springing from the bony part of the nasal septum, are not uncommon. They usually arise by a broad base, and extend horizontally outwards towards the outer wall, on a level with the inferior or middle turbinate bone. A frequent form of outgrowth is that of a ridge running from near the nasal spine of the superior maxilla obliquely upwards and backwards, at the junction of the septal cartilage and the vomer. This ridge is sometimes partly cartilaginous, partly bony. Sometimes exostoses spring from the floor of the nose. Exostoses rarely give trouble, but if it be necessary to interfere with them, they may be removed with the chisel, or a slender bone forceps, or with Bosworth's nasal saw. They may also be ground away with a burr worked by a dental engine, or with one of the small trephines devised by Curtis, which are worked by an electro-motor.

Curious bony tumours (**osteomata**) sometimes originate in the nasal fossæ, beneath the mucous membrane, but unconnected with the bony framework. Most osteomata, however, which invade the nasal fossæ, originate undoubtedly in one of the neighbouring sinuses, especially the ethmoidal cells. They mostly occur in young subjects. They are sometimes of spongy structure, but more usually of ivory hardness throughout. Freely movable while small, they

grow so as to fill the nasal passage, and displace or absorb the bony parietes, causing much pain and deformity. Nasal obstruction, pain, and epistaxis are prominent symptoms. The mobility of such a bony tumour will, in the early stage, distinguish it from an exostosis. It may simulate a nasal calculus, but the surface is generally more resistant to a needle pressed against it.

When soft they have been crushed up, and removed piecemeal, but hard ones may require the nose to be laid open to effect removal.

6. CYSTIC TUMOURS.

These tumours, resulting from morbid changes in the glandular structures, are exceedingly rare in the nasal passages. Bosworth could only find three such cases recorded. In these cases, the symptoms and appearance were much as in ordinary mucous polypus. The tumour is easily removed with the forceps or snare, and apparently does not tend to recur.

7. ANGIOMATA.

Angiomata, or blood-vascular tumours, are of very rare occurrence in the nose. They have been observed growing from the cartilaginous and bony septum, from the turbinate bodies, and the vault of the nasal fossa. The development of an angioma is usually somewhat slow. It gives rise to more or less obstruction according to the size it has attained. A muco-purulent discharge is generally present, but the frequent repetition of attacks of epistaxis is the most characteristic symptom. The tumour has a rounded, irregular surface, and a bright red or bluish-red colour. Its consistence is soft to the finger or probe, it bleeds easily, and may often be seen or felt to pulsate strongly. These tumours may usually be removed through the natural passages by

means of the galvano-cautery, or cold, snare. If the latter be employed, some form like Jarvis's, which can be very slowly tightened, must be used in order to avoid hæmorrhage. The base of the tumour may have to be treated with the galvano-cautery.

8. MALIGNANT GROWTHS.

Malignant disease is rare in the nasal passages. Sarcoma is the form which mostly occurs. The rare cases of true cancer, which have been reported, have been generally of the epitheliomatous variety.

Malignant growths affect children and persons past middle life. They may spring from any part of the nasal cavity, but are said to arise most often from the septum. The interior of the ala is sometimes the seat of sarcoma, or epithelioma. A sarcomatous tumour in the naso-pharynx sometimes becomes pedunculated, constituting malignant polypus.

The **symptoms** will be at first merely obstruction of the nasal passages and its attendant discomforts, with increased nasal or post-nasal discharge, purulent and fetid. Frequent and severe epistaxis is often a prominent symptom. Pain will generally be present as the disease advances. Deformity of the face from spreading out of the nasal bones, or protrusion of the eyeballs, and erosion of the base of the skull, may result. If the growth is cancerous, the glands at the angle of the jaw, and at the side of the neck, will early become affected.

Malignant tumours will generally be recognized by their rapid growth, the abundant discharge, and hæmorrhage, as well as by the physical characters and appearance of the growth. They are softer than fibromata, and less distinctly pedunculated.

If the disease be recognized early, **extirpation** by resection may be attempted, for although recurrence is to be feared, still life may be thereby prolonged. The growth of malignant tumours may be sometimes delayed by frequent and energetic application of the galvano-cautery. If the disease is far advanced all operative interference is useless.

XX.

FOREIGN BODIES.

FOREIGN bodies generally gain entrance to the nasal fossæ through the anterior nares. This accident is most frequent in children and insane people. The substances thus introduced are innumerable. Buttons, glass beads, peas, paper pellets, are favourite substances with children. More rarely foreign bodies enter the nose through the posterior nares, in vomiting or coughing. Escape of substances into the nose in deglutition occurs in paralysis of the soft palate. Lumbrici, which have got into the stomach, are sometimes expelled through the nose, or even lodge there for a time.

Symptoms.—The symptoms are those of irritation and obstruction, and their degree depends upon the size, shape, and nature of the body. Rarely a foreign body may remain lodged in the nose for a long time without causing any symptoms. Usually, symptoms of local inflammation are soon established. There is more or less discharge of a muco-purulent or purulent character, sometimes sanguineous, and often fetid. The obstruction will depend on the size of the body, and the amount of inflammatory swelling. Some bodies, like peas or beans, swell up, or even germinate *in situ*. Neuralgic pains in the nose, cheek, or head are sometimes present. If the body be not removed the symptoms persist for an indefinite time, with exacerbations and remissions, the discharge never entirely ceasing.

If a clear history be forthcoming of the entry of a foreign

body the diagnosis is easy. Often, however, especially in children, there is no such history to be got. A one-sided purulent discharge, in a child, should always suggest the possibility of a foreign body.

On examination with a speculum the mucous membrane may be so congested and swollen as to conceal the foreign body. The secretion, also, may have to be washed or wiped away before a satisfactory examination can be made. Most frequently the foreign body will be found lodged in the inferior meatus just beyond the vestibule. In long-standing cases the body may be surrounded by granulation tissue, and the appearance may at first sight suggest syphilis or cancer. The probe will be of service in making the diagnosis. Cocaine is very useful in facilitating the necessary examination.

Treatment.—The removal of a foreign body is usually best effected with a fine pair of forceps. A pair of forceps bent at an obtuse angle is the most convenient form. Sometimes a probe bent at the end into a hook, or some kind of spud is more efficacious, and occasionally it will be found more convenient to slip the loop of a snare round the body. A ten or twenty per cent. solution of cocaine should first be applied to the parts, and the passage cleansed with a probe dressed with cotton-wool. The operation must be conducted with the aid of a nasal speculum and a good illumination, and, to those accustomed to nasal manipulations, will not be a very difficult matter. On the whole, if the operator feels that he cannot easily remove it in this manner, it is better to try a stream of water, directed up the unaffected nostril with a syringe or douche. This will generally be successful in removing the body, if not firmly impacted. Of course, the injection of a forcible stream of water up the nose is not without its dangers, as has been stated when treating of the nasal douche. Sometimes it is necessary to push the body back into the naso-pharynx, in order to effect the removal. The

danger of its dropping into the larynx has probably been much exaggerated, but a finger may be inserted behind the soft palate as a safeguard.

Small children will generally have to be securely held in a nurse's lap with the aid of an assistant. An anæsthetic is, however, often necessary in children for the removal, or even for the diagnosis, of a foreign body.

XXI.

RHINOLITHS.

RHINOLITHS, or nasal calculi, are of infrequent occurrence. They usually, perhaps always, result from the deposition of phosphate and carbonate of lime around a nucleus of some sort, whether formed by a small foreign body, a blood-clot, or a small mass of retained secretion. The surface is generally rough and mammillated, and the colour greyish-black. They are usually rounded or oval in shape, and may attain to a considerable size. Unlike foreign bodies, rhinoliths are more frequently seen in adults than in children. I have, however, met with a case in a child of four.

The **symptoms** are similar to those attending foreign bodies, a purulent, and often fetid, or sanguineous, discharge being the most constant. In some cases, where the calculus has attained large dimensions, considerable erosion or displacement of surrounding parts has been present. Swelling of the external nose and face has also been noticed. The calculus may form in any part of the nasal fossa, but it is usually situated in the inferior meatus, where it can be seen, or can be felt with a probe. A sharp-pointed probe will generally penetrate the surface, a point of distinction from an osteoma, with which it is liable to be confounded.

Treatment consists in removal, which may generally be effected with a pair of forceps, unless the calculus has attained a large size. In the latter case it may have to be cut through, or broken up, with a bone forceps. Cocaine

should be applied, as in the case of foreign bodies. Extraction will usually be attended with brisk hæmorrhage, which, however, soon ceases. An anæsthetic will sometimes be required, especially in children. Division of the external nose has been resorted to for the extraction of a very large rhinolith.

XXII.

DEVIATIONS OF THE SEPTUM.

Nature and Causation.—Deviations, or deflections of the septum, from the median line, are very common; in fact, a perfectly straight septum is quite the exception. They occur almost exclusively in the anterior two-thirds of the septum; in the perpendicular plate of the ethmoid, at the ethmo-vomerine suture, in the vomer, in the anterior part of the maxillary crest, or in the triangular cartilage. The deviation, therefore, may be cartilaginous, osseous, or osseocartilaginous. The posterior part of the vomer is never implicated. The deviation of the septum may be single, or it may be double; that is to say, directed towards one side in front and below, and towards the opposite side farther back and higher up—the so-called sigmoid deviation. In some cases the bend is rounded and obtuse, in other cases it is sharp and angular. Again, the prominent bulge or angle may have either a more or less vertical, or a more or less horizontal direction. Deviations with the convexity towards the left are much more frequent than those with the convexity towards the right.

A form of septal deviation, often met with, is a dislocation of the bony or cartilaginous septum from the maxillary crest and anterior nasal spine. It very frequently exists quite in front, the edge of the cartilage being displaced from the nasal spine. This dislocation of the lower edge of the septal cartilage often coexists with a deviation of the cartilage in the opposite direction, higher up, so that while

the cartilage bulges into and obstructs one nasal passage, the free edge projects into and more or less obstructs the other.

Bony or cartilaginous thickenings, or ridges, are very frequently found on the septum, and such ridges are often associated with deviations of the septum, being usually situated on the convex side. They are, therefore, most common on the left side. These ridges are commonly found running along the line of junction of the vomer with the palate process of the superior maxilla, or along the junction of the anterior border of the vomer with the septal cartilage and the perpendicular plate of the ethmoid. This deformity is generally confined to one side, but may be developed at corresponding parts on both sides. When large, these ridges tend to further narrow the nasal cavity on the convex side, often pressing on the inferior or middle turbinate bone, or projecting into the middle meatus.

Another peculiarity, which has been found associated with deviated septum, is hypertrophy of the middle turbinate bone, opposite the concave side, encroaching on the otherwise spacious nasal cavity.

The **causation** of deviations of the septum is involved in much uncertainty. Some deviations are undoubtedly spontaneous, and some acquired. **Spontaneous** deviations are probably common. They do not exist at birth, the septum being always straight, according to Zuckerkandl, until the seventh year. They commence during childhood, and may be accounted for by asymmetry, or abnormal development of the bones of the head and face in various directions. It seems clear that the nasal septum, made up as it is of several parts of unequal strength, and fixed as a prop between the base of the skull above, and the arch of the palate below, must be influenced by the growth of the bones around, and by the greater or less development of the antrum of Highmore and the frontal sinuses. Under pressure, the septum

will bend in the direction of least resistance. Thus, a high-pitched, narrow, palatine arch, encroaching on the vertical growth of the septum, is generally accompanied by septal deviation. Ziem, however, holds that deviation of the septum is the primary abnormality, and the abnormal development of the bones of the head and face results from this. **Acquired** deviations may result from various external influences, such as injuries during parturition, blows and falls during childhood. Other causes, which have been suggested, are picking the nose, blowing the nose constantly with one hand, sleeping constantly on one side. No doubt these causes, or some of them, account for a large number of cases, especially, perhaps, of deformity or displacement of the cartilaginous system, but neither the appearance nor the history will, in the majority of cases, indicate the actual origin of the deviation.

Symptoms.—Many septal deviations, especially slight deviations, produce no symptoms whatever. Marked cases are often associated with external signs, such as inclination of the nasal bones, and of the whole external nose. Sometimes there is merely slight deviation of the tip of the nose, or asymmetry of the nasal orifices. When symptoms result, they are mainly those of nasal stenosis and chronic nasal catarrh. Sigmoid deviations may narrow both passages, and in cases of single deviation, the otherwise unobstructed nostril may be encroached upon by a large middle turbinate, which may press upon the septum, giving rise to the impression that the deviation has resulted from overgrowth of this body. The convexity of the bulge may press upon the inferior or middle turbinate, of the side towards which it projects.

Habitual mouth-breathing, nasal twang of voice, ear troubles, and other results described in the section on nasal obstruction, may therefore be present. The obstruction is liable to variations and remissions depending on the amount

of swelling of the soft parts present. The symptoms of nasal and post-nasal catarrh, which so often accompany stenosis from septal deviations, result partly from imperfect drainage of secretions, partly from irritation caused by contact of the sentient surfaces of the septum and spongy bones, and partly from the abnormal physical conditions which result from impeded passage of air. Liability to colds in the head is one of the most constant troubles associated with marked septal deviation. Hypertrophic rhinitis is frequently present, and is often most advanced in the side opposite to that encroached upon by the septum. There is no doubt that the prolonged irritation resulting from deflected septum, especially when the latter presses on one of the turbinate bodies, sometimes leads to a hyperæsthetic condition of the mucous membrane, which in turn tends, in predisposed subjects, to the development of paroxysmal sneezing, hay-fever, and other allied phenomena.

Epistaxis is a not infrequent result of deflected or deformed septum, the source of the blood being a little chronic erosion at the anterior part of the cartilaginous septum. These erosions are often situated in a concavity in front of a bend or projection of the cartilage. They appear to arise from the incoming current of air impinging upon this part, depositing thereon particles of dust, and causing dryness of the surface, the projecting septum partly protecting it from the moist expiratory current. Once formed, the erosion is kept up by the habit of picking off the dried crusts which form on the surface.

The diagnosis of deflected septum is generally easily made by anterior rhinoscopic examination. Careful examination of the two sides will serve to distinguish thickenings or projections on the septum from deviations. Seiler has devised an instrument for the purpose, which he terms a septometer, consisting of a pair of calipers, with an index for registering the thickness of the tissue grasped.

Treatment.—Slight deviations, leading to no inconvenience, will, of course, need no interference. Where, however, any trouble arises from stenosis of one or both passages, or where persistent catarrhal, or it may be reflex, symptoms appear to depend upon the abnormal condition of the



FIG. 35.—Adams's Septum Forceps.

septum, the advisability of interference should be always considered.

For moderate deviation of the cartilaginous septum in young people simple measures are sometimes efficacious. Digital pressure applied very frequently, many times a day, to the prominent side has been used with advantage. The

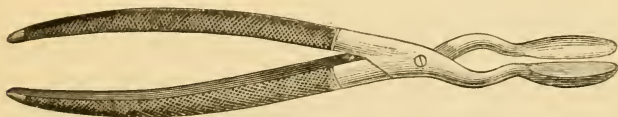


FIG. 36.—Walsham's Septum Forceps.

use of nasal bougies, introduced for a short time daily, or of hollow plugs which allow of the passage of air, and can be retained for longer periods, has also been found effectual in these simpler cases.

For most cases, however, more active means must be adopted. It would be impossible, within the scope of this work, to do more than briefly allude to some of the principal operations, from among the many, that have been devised for the relief of deformity of the septum. Forcible rectification, involving if necessary fracture of the septum, with

suitable forceps, such as Adams's (Fig. 35), or Walsham's (Fig. 36), is sometimes indicated. After forcible rectification some form of plug or retentive apparatus must be worn for some days, to prevent the septum returning to its former position. Adams advised a clamp, to be worn for three days, followed by ivory plugs, which were to be worn during the daytime till the parts had thoroughly consolidated. Jurasz and Capart have both devised forceps, the handles of which can be separated from the blades, so that the latter can be left in the nostrils as a retentive apparatus.

When there is marked cartilaginous bulging it will be necessary to adopt some method of overcoming the resiliency of the cartilage, otherwise it will almost inevitably return to its previous faulty position. The mucous membrane over the prominent part may be reflected, after which, a portion may be excised, or the prominent part may be shaved off, with or without previous reflection of the mucous membrane, or the cartilage may be divided in a stellate manner. After these procedures the cartilage is more easily restored and retained in position by plugs.

In consequence of the bony and cartilaginous thickenings or ridges which are present on the convex side, it will often be necessary to remove the projecting portion in order to restore the patency of the passage. For the removal of these ridges or projections various kinds of knives, scissors, cutting forceps, drills, trephines and saws have been devised. One of the best instruments for the purpose is Bosworth's nasal saw (Fig. 37). This instrument has a narrow slender blade, attached to the handle at an obtuse angle, and is used to saw down, vertically, through bone and cartilage, so as to completely remove the whole of the projecting portion. Where the saw is used to remove the projecting angle of a sharply-deflected septum, it will be found that a perforation is not produced owing to the thickening which is present at the point of flexion. A second saw with the edge upwards

is made so as to cut from below, in cases where the instrument cannot be introduced above the projecting part. In some cases the use of the saw may be followed by forcible rectification, and subsequent wearing of some form of plug. In these operations on the septum pretty sharp hæmorrhage may be looked for, but this always quickly ceases after the operation. An anæsthetic will often be required, but simple removal of angular projections may be done with the aid of

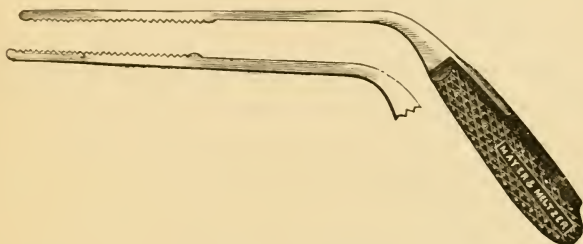


FIG. 37.—Bosworth's Nasal Saw.

a twenty per cent. solution of cocaine injected submucously and painted over the surface.

In some cases, where a nasal passage is narrowed by a deformed septum, the stenosis may be sufficiently relieved by the application of the galvano-cautery to the swollen tissues on the inferior turbinate bone. Care must be taken, in using the cautery in a narrow passage, not to burn both surfaces, and so produce cicatricial adhesion between the two sides.

XXIII.

HÆMATOMA OF THE SEPTUM.

EXTRAVASATION of blood beneath the mucous membrane of the septum, forming a blood tumour of variable size, is commonly the result of a blow, or other violent injury, to the nose. As the effusion is generally associated with fracture of the bone or cartilage the resulting tumour is usually bilateral. The tumour is of a red or purple colour, and can mostly be seen to arise from the forepart of the septum, just within the nostril. It has a soft, fluctuating feel, and is usually pretty symmetrical on the two sides. Fluctuation can often be obtained from one nostril to the other, by using a forefinger in each nostril. The swellings may be so great as to expand the *alæ nasi*, and to protrude like polypi from either nostril. A case which came under my care looked, at first sight, very much like a case of mucous polypi protruding from each nostril, and in fact it had been mistaken for such.

The history of the swellings having followed a blow will generally indicate their nature. Inspection shows them to proceed from the septum by a broad base. The diagnosis from abscess of the septum will be indeed the only real difficulty. A hæmatoma which does not soon subside is apt to pass on to suppuration.

A few cases of spontaneous hæmatoma of the septum, in this case unilateral, have been recorded.

Treatment.—Rest, and the early application of evaporat-

ing lotions, will generally lead to the gradual dispersion of a hæmatoma. It is not advisable to incise the tumour, unless the extravasation be very large, and the distension very urgent. If incised, a permanent opening in the cartilaginous septum sometimes results.

XXIV.

ABSCESS OF THE SEPTUM.

Acute abscess is usually the result of some injury. It may result from suppuration of a traumatic hæmatoma, as already mentioned. The abscess is generally situated at the fore part of the septum. There is much local pain, and the nose, and sometimes the cheeks, and contiguous parts, become red and swollen. The tumour, which is bilateral, is smooth, red, tender, and fluctuating. Fluctuation can often be obtained from one nostril to the other owing to a perforation of the cartilaginous septum, the result of the original injury, or of the abscess.

Chronic abscess usually results from injury, though it is said sometimes to occur spontaneously, especially in scrofulous or syphilitic subjects. The abscess is seated at the fore part of the septum, and it may be unilateral or bilateral. The onset and progress are insidious and the local symptoms slight. Some stoppage in one or both passages may be the only symptom noticed.

The **treatment** of septal abscess consists in early incision, and free drainage. If the tumour is bilateral, an opening should be made in both sides. In acute abscess the mucous membrane will often heal over the septal perforation, but a permanent opening usually results from chronic abscess.

XXV.

PERFORATING ULCERS OF THE SEPTUM.

PERFORATION of the septum nasi is a frequent result of syphilis. Lupus, also, in younger subjects, and tubercular ulceration, may lead to the same condition. Abscess and hæmatoma of the septum may also terminate in a permanent opening. Independently, however, of any of these causes the cartilaginous septum may be perforated by an ulcerative process, the exact origin of which is often doubtful, and which one may term **simple perforating ulcer** of the septum.

The ulcer commences in the mucous membrane at one or other side of the septum, but before perforation takes place the mucous membrane at the opposite side is affected. The mucous membrane of the septum serves for the nutrition of the cartilage, and its destruction leads to necrosis of this structure. Hutchinson* describes the ulcer as slowly progressive and occurring usually after middle age. He found it about equally frequent in both sexes. Voltolini describes simple perforating ulcer of the septum as occurring mostly in men.

Nothing can be said with certainty as to the cause of the perforating ulcer. It is true that the current of air entering the nostril impinges on the fore part of the cartilaginous septum, and particles of dust and such-like may lodge there, and the irritation therefrom may beget the habit of picking

* *Medical Times and Gazette*, July 5, 1884.

with the finger by which erosion and superficial ulceration are sometimes caused. Such chronic ulcers of mechanical origin are in fact common enough, and are often the source of hæmorrhage, but if they lead to perforation it is only very rarely, and under some exceptional circumstances. Voltolini thinks that the perforating ulcer is of hæmorrhagic origin, the vascularity of the mucous membrane at this part being very marked. I have twice seen perforation of the septum apparently of the kind in question, in association with nasal polypi.

The ulcers cause little or no inconvenience, and are quite painless. They may give rise to a habit of picking the sore, and occasional epistaxis may occur. The usual site is just within the nostril, about half an inch above the columna. Sometimes perforation has already taken place, when the lesion is discovered, without any definite history to show how long it has existed. The edge of the perforation may show ulceration progressing over a greater or less extent, or it may be already wholly healed at the time of its discovery. The bony septum is never involved, in contrast with syphilitic ulceration, from which the disease in question is further distinguished by the less rapid course, the absence of fetor, and the general history.

The **treatment** consists in endeavouring to arrest the ulceration, whether perforation has already occurred or not, by treating the ulcerated surface with some caustic application. Nitrate of silver, the acid pernitrate of mercury, and the galvano-cautery have all been found useful. Dilute citrine ointment may be used as a dressing for the sore.

Workers engaged in the manufacture of **chromic acid** and its salts* are liable to a peculiar perforating ulcer of the cartilaginous septum, caused by the local action of the vapours, or dust of these substances. It is said that up-

* Chevallier and Bécourt, *Ann. d'Hygiène*, July, 1863; Richardson, *Lancet*, March 11, 1882; Pye, *Ann. of Surgery*, 1885.

wards of fifty per cent. of the workers suffer in this way. The symptoms attending this affection are more or less irritation, sneezing, and watery discharge in the early stage, and later, a discharge containing crusts, and sometimes blood, but never offensive in character.

Symmetrical ulcers, with greyish-white bases, form on each side of the cartilaginous septum. In the course of some months or a year, a small perforation takes place, and the hole rapidly enlarges to the size of the ulcer, and then stops. These holes may occupy a greater or less extent of the cartilaginous septum, but never invade the bony septum or the columna. The process is unattended with pain. No deformity of the external nose results. Those who are affected with perforation are said not to suffer subsequently from nasal catarrh, to which their occupation previously rendered them subject.

Workers in **arsenic** sometimes suffer from similar perforations of the septum.

Cement* workers are said sometimes to suffer from perforating ulcer of the cartilaginous septum. This is probably due to irritation caused by the dry cement dust which is drawn into the nostrils, and to the habit of picking the nose which is thereby caused.

* Foulerton, *Lancet*, August 17, 1889.

XXVI.

SYPHILIS.

1. ACQUIRED SYPHILIS.

INSTANCES have occasionally been reported of a **primary** syphilitic sore occurring within the nostril. During the **secondary** period the nasal mucous membrane is not unfrequently affected, though with nothing like the same frequency as the fauces. The condition may be one of hyperæmia, or mucous patches or superficial ulcers may form on the internal surface of the alæ nasi, or on the inferior turbinate body, or the septum. Symptoms of coryza, with more or less mucoid or muco-purulent discharge, may be present. Sometimes pustules or little ulcers form in the hair follicles within the nostrils, and fissures occasionally form round the margins of the orifices.

Tertiary lesions of the nose are more common and more important than those of the secondary period. Deposits of gummatous infiltration take place in the mucous membrane, which after a time break down, leaving an ulcerated surface. The gummatous infiltration usually involves the whole thickness of the mucous membrane, the deepest layer of which constitutes the periosteum and perichondrium, and the breaking down of the deposit lays bare the bone and cartilage, and leads to necrosis of these structures. In some cases the primary deposit is in the bone itself. The most frequent seat of gummatous infiltration is the septum,

either in its cartilaginous or osseous part, but the floor, roof, or structures on the outer wall, may be affected.

In the earlier stage the symptoms resemble somewhat those of chronic rhinitis. There is more or less obstruction, with increased secretion. Pain may or may not be present, and it may exhibit the usual nocturnal exacerbations. These symptoms may continue for some weeks or months gradually increasing. During this period the disease is unfortunately only too often unrecognized. Sooner or later symptoms of a different character and more serious nature arise. The discharge increases in quantity, becomes purulent, offensive, and not unfrequently blood-stained. Crusts form in the nasal passages, and are discharged from time to time. There is now generally an intolerably offensive odour, and the term syphilitic ozæna is applied to the condition. It may here be mentioned, with regard to the offensive odour, that no amount of cleansing will ever thoroughly remove it, in contrast with the behaviour of the odour of simple ozæna (atrophic rhinitis). After a time particles of dead bone may be discharged with the secretion, or may drop back into the throat, and be spat up. Meanwhile the external nose may have gradually sunk in, to a greater or less extent, constituting a permanent and characteristic deformity.

If the nose be examined in the earlier stage, swelling will be observed in some parts of the passage, or the swelling may be such as to completely prevent inspection of the cavity. Later, ulcers of a deep, irregular, ragged character will be present, at the bottom of which bare bone may be seen, or more often detected with the probe. It will generally be necessary to cleanse the cavities with a syringe, to remove the dirty brown or greenish crusts which conceal the parts. Perforation of the septum is very commonly found, involving usually the cartilaginous part, but often enough the bony structure as well. The perforation has generally a rounded form, the edges being covered with adherent crusts.

Sometimes there is more than one perforation. The posterior edge of the vomer between the choanæ generally remains intact, and so does the columna in front.

The floor of the nose is often involved in the gummatous infiltration, and necrosis of the whole thickness of the hard palate may ensue. In this case a rounded fluctuating swelling forms in the roof of the mouth, near the middle line, which soon breaks down, and allows dead bone to be felt with the probe. Finally, through loss of a portion of the bone, a hole may be left between the mouth and nose. The turbinate bones may be partially or wholly destroyed, in the latter case leaving a very wide roomy nasal passage. In rare cases the destruction of bone may involve the base of the skull, and may thus lead to meningitis.

One of the most characteristic features of nasal syphilis is deformity of the external nose. This varies in kind and degree, and is sometimes absent even in severe cases. In consequence of the loss of the support which should be afforded by the septum, combined with relaxation of the tissues uniting the cartilage to the nasal bones above and behind, the lower part of the nose sinks in, and is, moreover, more or less retracted within the upper bony segment. The profile of the nose then presents a broken line, the break being caused by the projection of the lower ends of the nasal bones, and a slight groove in the integument at this level indicates the recession of the lower into the upper segment. In point of fact, if the tip of the nose be drawn forwards, the groove is obliterated, and the deformity corrected for the moment. If the nasal bones themselves have been attacked by the disease, the bridge of the nose is flattened in, below the frontal spine. With the falling in of the bridge the soft parts seem to drag on the tip of the nose, tilting it up, and causing the anterior nares to look more directly forwards. In other cases, again, the whole of the prominence, from the frontal spine to the tip of the nose

sinks in, and is replaced by a flat, or even a concave, surface. In rare cases the tissues of the external nose may be eaten away by the disease.

The **naso-pharynx** is sometimes the seat of tertiary syphilis. Gummatous infiltration of the soft palate often breaks down, on its posterior aspect, first, and the resulting ulcer can only be seen with the aid of the rhinoscopic mirror. The posterior wall of the naso-pharynx is sometimes the seat of a deep, round, tertiary ulcer, which may be detected by raising the soft palate, or with the aid of the rhinoscope. Simultaneous ulceration of the posterior surface of the palate and the wall of the naso-pharynx may eventuate in cicatricial adhesion, and partial or complete occlusion of the lower opening of the cavity.

Treatment.—The constitutional treatment must be conducted on the ordinary lines, according to the stage of the disease and the condition of the patient. Locally, an alkaline lotion may be found useful in the coryza of secondary syphilis. Mucous patches may be touched daily with a solution of chromic acid (gr. x to ʒj).

In tertiary syphilis, after the establishment of ulceration, frequent washing out of the nasal cavity with disinfecting lotions, by means of a douche or syringe, will be necessary to remove the secretions, and counteract the offensive odour. After thorough cleansing, which ought to be repeated at least once daily, iodoform or iodol may, with advantage, be insufflated into the cavity. Some authorities strongly recommend scraping, with the sharp spoon, the deep, unhealthy ulcers which lead down to diseased bone. Loose sequestra should be carefully removed with forceps as soon as practicable.

2. INHERITED SYPHILIS.

The **early**, or **secondary**, stage of inherited syphilis shows a special predilection for the pituitary membrane. The symptoms are often present at birth, and if not, they generally develop within the first month or six weeks. The mucous membrane is congested and swollen, and probably mucous patches are often present, though it is usually difficult to detect the exact condition. There is more or less discharge, and the nose is partly or wholly blocked, whence results the noisy nasal breathing known as "snuffles." The discharge is thin at first, and afterwards becomes thick and yellow. The orifices of the nose often get cracked, and mucous patches, radiating fissures, or small ulcers occur about the angles of the alæ nasi. The passages may become blocked with crusts, and a more or less sanious fluid may ooze from the nose. The interference with breathing, caused by the nasal obstruction, may be serious hindrance to suckling, and lead to suffocative attacks in sleep. The inflammatory condition of the mucous membrane in infants very rarely extends to the periosteum and perichondrium so as to lead to destruction of these structures and of the subjacent bone and cartilage. Nevertheless a certain amount of nasal deformity is quite common in syphilitic infants. This consists in a flattening and spreading out of the bridge of the nose. This condition may be present very early, and may attain a very marked degree without any evidence of disease of nasal bone or septum. The exact nature of the process which leads to this common deformity is uncertain.

The **later** stage of inherited syphilis often affects the nose, and in the same fashion as the acquired disease. The symptoms may commence at any age between three and four years and adult life. Occasionally they are continuous from

infancy with the early symptoms just described, but usually a period of freedom of some years intervenes. Probably the most frequent date of the outbreak of late symptoms is at or shortly before puberty. Sometimes the disease begins as tubercular nodules on the fore part of the septum, or the interior of the *alæ* of the nose, where the lesions are more or less accessible to view. The tubercles break down, leaving little ulcers, which may run together. The surface of the ulcers is often covered with crusts, which more or less obstruct the nasal orifices. The disease in this condition, as Fournier points out, is too often mistaken for a scrofulous eczema, or impetigo, and treated accordingly. Portions of the *alæ nasi*, or cartilaginous septum, may be eaten away before the disease is arrested. More often the gummatous deposit takes place in the deeper parts of the nose, and the symptoms resemble those of a chronic rhinitis. The nose is obstructed, and there is more or less mucopurulent secretion and formation of crusts. After some months the secretion becomes purulent, blood-stained, and offensive. Even then the disease is often enough attributed to scrofula. Finally, pieces of bone may be discharged, and deformities of the external nose may occur, exactly like those already alluded to under the head of acquired syphilis, and from exactly the same causes. Perforation of the nasal septum at some part is one of the most constant lesions of inherited, as of acquired, syphilis. Perforations of the hard palate may also occur from disease commencing in the floor of the nose.

Moldenhauer lays stress on the fact that after extensive syphilitic disease (inherited or acquired), of the nasal cavity, even when the complaint has been thoroughly cured, the mucous membrane does not return to its normal condition, but passes into an atrophic state, which bears a striking resemblance to atrophic rhinitis. The wide cavity resulting from more or less destruction of the turbinate bodies may

contribute still further to the resemblance. The presence of perforation of the septum, or of obvious scars, or cicatricial bands, would lead to a correct diagnosis, but there is no doubt that these two conditions are sometimes confounded.

The posterior wall of the naso-pharynx may be the seat of a round deep ulcer, concealed from view by the soft palate, and often difficult to discover, with the rhinoscopic mirror, on account of the age of the patient. Ulceration in the region of the soft palate and pharynx may lead to cicatricial adhesions, and partial or complete closure of the naso-pharynx from below.

The diagnosis of late inherited syphilis from lupus is sometimes a matter of difficulty, and syphilitic affections of the nose are not unfrequently regarded as lupus, with results of a disastrous character for the treatment of the disease. It must be borne in mind that whereas syphilis has a special predilection for the nasal passages, lupus rarely attacks them in the first instance, the disease usually spreading thither from the face. Lupus pursues, on the whole, a slower course than syphilis. It rarely, if ever, leads to destruction of the bony framework of the nose, whereas syphilis does so habitually. The peculiar deformities of the external nose, described above as resulting from loss of support within, especially the collapse of the bridge, are almost invariably diagnostic of syphilis, as also are the perforations of the hard palate. In doubtful cases the administration of iodide of potassium will clear up the diagnosis.

Treatment.—In infants the administration of mercury, internally, or by inunction, will be necessary. In bad cases it will be requisite to clear the nasal passage of the accumulated discharges. In most cases this may be accomplished with a feather or camel-hair pencil. In other cases careful syringing with a tepid alkaline lotion will be needed. A

little iodoform or iodol may be insufflated into the nostrils once or twice a day after cleansing. Spoon-feeding, or even the stomach-tube, may be necessary where the nasal obstruction interferes seriously with the infant's power of sucking.

In the later forms of inherited nasal syphilis the local and general treatment is identical with that of the corresponding state in the acquired disease.

XXVII.

SCROFULA, LUPUS, AND TUBERCULOSIS.

THE relationship between scrofula, lupus, and tuberculosis is of the closest nature. The discovery of an identical bacillus in lesions characteristic of each of them, may perhaps be regarded as evidence that these lesions are merely phases of one and the same disease. Many of the so-called scrofulous lesions are undoubtedly tuberculous. The term scrofulous is, however, conveniently retained as a clinical designation for persons who exhibit a proneness to a peculiar type of chronic inflammation affecting the skin, mucous membranes, joints, bones, etc., together with a tendency to enlargement, caseation, or suppuration of lymphatic glands. As to lupus and tuberculosis, there are certain well-recognized clinical features peculiar to each which make it necessary to describe them as separate affections.

SCROFULA.—Scrofulous children are peculiarly liable to suffer from nasal catarrh, both acute and chronic, and there is, in them, a greater tendency for the secretion to assume a purulent character. Crusts are apt to form in the anterior part of the nasal passages and at the margins of the nostrils. Removal of the crusts may discover ulceration on the inner surface of the ala or on the anterior part of the septum, or small fissures on the edges of the alæ. Whether scrofulous ulceration can lead to perforation of the septum or destruction of the turbinate bones is doubtful. Defects in the septum, and turbinate bones, are occasionally met with in

children in whom syphilis can with certainty be excluded, and in whom a scrofulous process seems the most reasonable explanation of the condition. Moldenhauer has occasionally observed a chronic abscess develop on the anterior part of the septum, which he referred to the influence of scrofula. The abscess was generally bilateral, and after evacuation usually left a permanent opening in the septum.

LUPUS.—Primary lupus of the nasal mucous membrane is rare. As a rule the integument, externally, is first affected and the disease spreads thence to the nasal passages. In the nose as elsewhere the disease probably always begins in early life, although it may give little trouble for a long time, and may therefore not come under observation till a more advanced age. The cartilaginous septum is the part most often affected. The disease commences as small pale red granulations, which after a time break down into ulcers. The ulcers are usually covered with crusts, and gradually spread in surface and depth, and perforation of the septal cartilage is a frequent result. The disease in course of time invades the fore part of the middle and inferior turbinate bodies, and other parts of the nose. Necrosis of bones is said never to result from lupus (*Kaposi*). The cartilages of the alæ may be involved, and one or both alæ destroyed.

The symptoms at first are merely those of coryza, and later, in proportion to the extent of the ulceration, a thin purulent and perhaps fetid discharge is present, and the nose becomes obstructed by crusts.

In the absence of lupus nodules on the skin, the diagnosis of nasal lupus may be difficult. A careful examination of the parts, after removal of the crusts, may enable the little lupus granules to be recognized, and the characteristic scarring here and there, while ulceration is spreading in other places, may be seen.

Great difficulty may arise in distinguishing lupus from syphilis. Lupus, however, pursues a slower course than

syphilis. It does not implicate the bones. Lupus nodules frequently coexist on the external parts. The history may throw light on the nature of the disease, but it must be remembered that lupus may occur in a syphilitic subject. In some cases a course of iodide of potassium is the only sure test of the nature of the complaint.

Treatment.—The affected tissue should be destroyed as soon as possible. This may be done by scraping with a curette, or by the use of a fine galvano-cautery point. Caustics, such as chloride of zinc, chromic acid, or caustic potash have also been employed, but their use is not so easily directed and controlled as the curette or galvano-caustic point. Constitutional treatment with cod-liver oil, iron, etc., should of course be employed.

TUBERCULOSIS.—Tubercular disease of the nasal mucous membrane is very rare, though, no doubt, it is sometimes overlooked. Several cases have been described during the last few years by Riedel, Weichselbaum, König, Schäffer, Cartaz, Luc, and others. It has been met with as a primary disease, but is almost invariably associated with tuberculosis of the lungs. The favourite situation is the septum, and it appears usually to commence there, though, in long-standing cases, the floor of the nose and the turbinate bones may be involved.

The disease has been met with in two principal forms, viz., as tubercular ulceration, and as tubercular tumours. These two forms may be present together. Ulceration begins usually insidiously. There may be one or more ulcers, usually only one, and the favourite situation is the septum, or floor, not far from the anterior naris. The ulceration has been observed to extend occasionally from the nose on to the upper lip. Tubercular ulcers in the nose resemble ulcers of the same nature elsewhere. They have a rounded or oval shape, a dirty, greyish-yellow, uneven base, and raised, irregular edges. Little caseous nodules, or miliary

granulations, may be present here or there on the base, and, around the ulcer, yellowish-grey granulations may be seen. The ulcers are very chronic, showing no tendency to heal. Perforation of the underlying cartilaginous or bony septum may occur.

Tubercular tumours have been met with of various sizes, from a millet-seed to a walnut, and have been found seated on the cartilaginous septum and on the inferior turbinate body. The colour varies from pale to dark red, and the surface is often uneven and raspberry-like, and easily bleeds. The consistence is soft and friable; somewhat harder at the base. After a time these tumours may break down into ulcers.

The symptoms of tubercular disease in the nose are those of chronic nasal catarrh, attended with more or less obstruction. The discharge may be serous at first, but afterwards becomes purulent and fetid. There is generally no pain. The existence of chronic ulceration or nodular swellings, with phthisical history or symptoms, will raise the suspicion of tubercle. Microscopical examination of the growths, and ulcerated tissue, revealing a structure characteristic of tubercle, giant cells, and tubercle bacilli, is the surest means of diagnosis. The bacilli are described as being few and by no means easy to find. The diagnosis from lupus may be very difficult if there are no lupus nodules coexisting on the skin. The presence of bacilli will, however, establish the difference. It is true that bacilli have been demonstrated in lupus tissue identical with Koch's bacilli, but they are so excessively rare and hard to find, that their presence in any appreciable number would decide the diagnosis in favour of tuberculosis.

Treatment.—Mild disinfecting lotions, and iodoform or iodol insufflations, should be used to correct the fetor and discharge. Attempts should be made to eradicate the

disease by scraping away the diseased tissue with a curette, or destroying it with the galvano-cautery. The application of lactic acid, which has been found useful in tubercular ulceration of the larynx, might prove efficacious in this form of the disease. Complete healing of the ulcers is said to be rarely accomplished.

XXVIII.

DIPHTHERIA.

PRIMARY diphtheria of the nose is very rare. The possibility of its occurrence should, however, always be borne in mind. When diphtheria originates in the nose it may remain confined to that passage, or it may spread down to the pharynx or larynx. Monti states that primary nasal diphtheria is not very uncommon in infants during the first six or eight weeks of life, such cases generally terminating fatally.

Diphtheria of the nose is in most cases a complication of the disease in the pharynx. It spreads to the nose along the posterior pharyngeal wall, and along the posterior surface of the soft palate. As this occurs chiefly in severe cases, and is unattended with pain, the invasion of the nose may remain unrecognized at first. Extension of the disease to the naso-pharynx and nose is, however, always a serious complication, and such cases usually pursue a very unfavourable course.

The earliest **symptoms** of nasal diphtheria are some impediment to nasal respiration, and a discharge of a thin, ill-smelling fluid. As the disease extends, the nasal obstruction increases, and the discharge becomes more abundant, of a dirty brownish or blood-stained appearance, and shreds of membrane may be discharged or blown from the nose. The orifices of the nose and the upper lip become excoriated by the discharge, and occasionally diphtheritic membranes

form upon the excoriated surfaces. Swelling of the nose and œdema of the upper part of the face, and of the eyelids, may be present in severe cases. Epistaxis is not uncommon, and may be so severe as to contribute to a fatal result.

Extension of the disease to the lachrymal duct will cause overflow of tears, and diphtheritic conjunctivitis may occur from further extension. Simple or diphtheritic inflammation often obstructs the Eustachian orifice, and the process may extend along the tube to the middle ear, leading to destructive disease in that part. The symptoms attending Eustachian complication are chiefly, darting pains, and noises, in the ears, deafness, and perhaps, later, a purulent discharge from the external meatus.

Examination through the anterior nares will reveal swelling and redness of the mucous lining, and diphtheritic membrane covering more or less of the surface. With the rhinoscopic mirror the membrane may be seen on the posterior surface of the soft palate, the vault of the nasopharynx, or about the choanæ.

A nasal twang of voice, and the regurgitation of fluids through the nose while swallowing, are familiar symptoms of diphtheritic paralysis of the soft palate.

Treatment.—Recognizing the possibility of primary nasal diphtheria, we should watch with suspicion cases of nasal catarrh, during an epidemic of diphtheria. Whether nasal diphtheria be primary or secondary, the main point to be attended to, in the treatment, is to keep the cavities clean, and so prevent septic poisoning from absorption of putrid products. This is done by frequent use of warm disinfectant solutions. The fluid may be used with a syringe, douche, or spray, according to the age of the patient, and the amount of obstruction. A syringe generally serves very well. The cleansing must be repeated frequently, every hour if necessary. Care must be taken not to wound the mucous membrane, and for this reason the mechanical removal of the

membrane is rarely advisable. It is better to attempt the softening and removal of these, by periodical injections of lime water, or other alkaline solutions, or of a five per cent. solution of lactic acid. Papayotin may also be used for this purpose in a five per cent. solution. Insufflation of iodoform or boric acid may be advantageously used after washing out the cavities.

XXIX.

AFFECTIONS OF THE NERVES.

1. OLFACTORY NERVE.

Anosmia.—Anosmia, or loss of smell, is the commonest derangement of the olfactory sense. The causes of anosmia are various, inasmuch as several conditions are concerned in the proper performance of the function of the olfactory nerve. These conditions are, firstly, the integrity of the olfactory nerves and centres; secondly, a normal condition of the mucous membrane in which the nerve is distributed; thirdly, free access of air, containing the odorous emanations, to the olfactory region.

The olfactory nerves, or bulbs, may be injured by blows or falls on the head, and the bulbs may suffer from the presence of intracranial tumours, inflammation, or abscess. Congenital absence of the olfactory bulbs and nerves has been recorded by Rosenmüller and Pressat. In disease of the cerebral hemispheres loss of smell is rare, and in the cases reported the anosmia was generally, though not invariably, on the same side as the lesion. Anosmia is sometimes noticed as a symptom in locomotor ataxy. Loss of smell on one side, *hemianosmia*, is an occasional hysterical manifestation. Excessive stimulation of the olfactory nerves by strong smells has been known to cause temporary or permanent anosmia. In old age the acuteness of the sense of smell diminishes.

Pathological conditions of the mucous membrane contain-

ing the terminal distribution of the olfactory nerves, such as that existing in atrophic rhinitis, trophic changes the result of long-continued paralysis of the fifth nerve, and abnormal dryness from any cause, may produce anosmia. A douche containing medicinal substances, such as zinc, alum, and carbolic acid, sometimes exerts an injurious influence on the olfactory region, probably by injury to the epithelium, which leads to anosmia. It would appear that the presence of pigment in the olfactory membrane is important for the integrity of the sense of smell. Loss of pigment in this region, in consequence of general loss of pigment all over the body, has been found associated with disappearance of the sense.

Of obstruction to the free passage of air the commoner causes are, hyperæmic or inflammatory swelling, hypertrophic conditions, polypi, accumulation of crusts and secretions, deviation of the nasal septum, paralysis of the dilator muscles of the nostrils, and occlusion of the nasopharyngeal passage by syphilitic cicatricial contraction or otherwise. Moreover, destruction of the external nose, by which the current of air is no longer directed upwards in sniffing, impairs the power of smell.

Symptoms.—Loss of smell may be partial or complete, and may affect one or both nostrils. When it affects only one side, the patient may be unaware of the defect, which will only be detected by testing each side separately, the other nostril being closed. In testing the sense of smell, one must be careful to use substances which are merely odoriferous, such as musk, camphor, assafoetida, peppermint, or oil of cloves, and not those which, like ammonia or acetic acid, only irritate the fifth nerve. It is also important to use substances which are familiar and can be easily named. Zwaardemaker's olfactometer, for estimating diminution in the acuteness of the sense of smell, is described at page 25. Persons affected with anosmia very commonly say they have

lost their sense of taste. On testing them, however, with salt, acid, sweet and bitter substances, it will be found that taste proper is not affected, but merely the perception of flavours. This perception is accomplished by the olfactory nerve, which is stimulated in this case by odorous particles reaching it by the posterior nares. On the other hand, there is often complete inability to appreciate odours through the anterior nares, owing to obstruction, and yet some perception of flavours remains, owing to the free access of odoriferous particles to the olfactory region through the posterior nares.

Treatment.—All local obstructive diseases, such as hypertrophic rhinitis, polypi, etc., will be treated on the ordinary lines. It must be remembered that when from any cause the function has been long in abeyance, the removal of the cause may not be effectual in restoring the sense.

Strychnia taken internally, or applied locally, as a snuff, to the mucous membrane of the nose, has been found to increase the keenness of the sense of smell. This drug, therefore, is indicated in many cases of neurotic or doubtful origin, and in cases where the sense is impaired through having been long in abeyance. Althaus recommends a snuff containing a twenty-fourth of a grain of strychnia in two grains of powdered sugar to be used three times a day, the dose being increased up to a sixteenth or a twelfth of a grain.

The constant current has been recommended for anosmia, the positive pole being placed behind the mastoid, the negative to the nasal bones. Too strong a current will cause faintness and giddiness, and must be avoided, although, as Althaus has pointed out, a very strong current is necessary in order to really stimulate the olfactory nerve.

Iodide of potassium is, of course, indicated if syphilitic disease in the nerve centres, or elsewhere, be the suspected cause.

Hyperosmia and **Parosmia** are terms applied, respectively, to an exaggeration and a perversion of the sense of smell. Excessive sensitiveness of the olfactory organ is most frequently noticed, as a symptom, in hysterical subjects. It is also occasionally met with as an idiosyncrasy in certain persons who are peculiarly affected by particular odours. Parosmia is met with in two forms, either as a perception of odours which are not present, or, more frequently, as an alteration of the odour which is presented, the alteration being usually of an unpleasant character. Subjective sensations of smell may result from irritation of the nerve or of the cerebral centres. Epileptics, as is well known, are sometimes subject to a sensory **aura** in the form of an olfactory sensation. Insane persons are frequently subject to hallucinations and illusions of smell. Cerebral disease, and affections of the olfactory bulbs and nerves, may be attended with perversions of the sense of smell. Anomalies of smell are sometimes met with in persons apparently healthy in every way. Morell Mackenzie mentions the case of a man to whom violets always seemed to smell like phosphorus, and another to whom mignonette had the odour of garlic.

2. FIFTH NERVE.

Anæsthesia of the nasal mucous membrane is rare, and may result from a central lesion, or some lesion of the fifth nerve in its peripheral course. Cerebral tumours and syphilis are the most usual causes. The anæsthesia is generally unilateral. There is dryness of the affected nostril, insensibility to touch, and absence of sneezing on the application of irritants. Pungent odours, such as ammonia, are not perceived. The true olfactory sense is diminished, owing to the dryness of the mucous membrane in the first instance, and in course of time from nutritive changes in the elements of the olfactory mem-

brane. Althaus* has reported a curious case in which there was paralysis of sensation of all the parts supplied by the fifth nerve on each side. Here the sense of smell was normal, but there was an abundant discharge of acrid mucus from each nostril, causing severe excoriation of the lips.

Hyperæsthesia of the nasal mucous membrane is common. The condition is of interest not only on account of the local symptoms resulting therefrom, but also on account of the symptoms in more distant parts, which are so often found associated with it. The sensitiveness of the nasal mucous membrane varies in different persons within what may be considered physiological limits. The tendency to hyperæsthesia may be inherited, and it may be associated with neurotic conditions of various kinds. It is undoubtedly often acquired by long-continued peripheral irritation from intra-nasal disease.

Hyperæsthesia manifests itself by excessive sensibility, unpleasant sensations, itching or tickling feelings, sneezing, and increased secretion, on the application of the slightest irritant. Hypersensitiveness to certain special irritants, such as the pollen of plants, may exist in certain individuals. Moreover, irritation in other parts, such as the eye, the ear, or the sexual organs, may excite the hyperæsthetic mucous membrane. The various affections which arise in distant parts, as the result of excitation of a hyperæsthetic nasal mucous membrane, are referred to in the section on Reflex Nasal Neuroses.

Treatment.—The treatment of these affections must be directed to the cause, where this is discoverable. So far as hyperæsthesia may depend on intra-nasal disease, the treatment will be directed towards the removal of the disease. Cocaine applied to the nasal mucous membrane produces temporary anæsthesia, and relieves all the symptoms of hyperæsthesia. The effects, however, soon pass off. Menthol

* *British Medical Journal*, 1878, page 831.

also produces a temporary anæsthesia of the mucous membrane (see page 25).

The most effectual treatment of hyperæsthesia is the destruction of the mucous membrane with a suitable caustic. This, of course, would only be indicated where hyperæsthesia was giving rise to troublesome reflex or other symptoms. The most sensitive areas should be sought out with a probe, and the surface treated with chromic acid, or the galvano-cautery. Only a limited area should be treated at any one sitting, and time allowed for this to heal up before repeating the process elsewhere.

3. FACIAL NERVE.

Paralysis of this nerve is attended with flaccidity of the corresponding ala nasi. The nasal aperture is narrowed, and, so far from dilating, it tends to be drawn inward by the act of inspiration, or sniffing. The sense of smell and nasal respiration are interfered with, and when both nostrils are affected oral breathing is a necessity.

There is another form of paralysis of the muscles which move the alæ nasi which is due, not to affection of the nerve, but to wasting of the muscles from long disuse. This is observed in cases of long-standing nasal obstruction, and often remains after the original cause of the obstruction has ceased to act.

XXX.

DISEASES OF THE ACCESSORY SINUSES.

1. FRONTAL SINUS.

Catarrhal conditions of the lining membrane of the frontal sinus generally arise by extension from the nasal mucous membrane. Acute catarrh often extends from the nose into the frontal sinuses, especially in certain predisposed individuals, and in some epidemic forms of nasal catarrh. The symptoms indicating this extension are a sensation of fulness or weight, or of more or less acute pain in the forehead, especially between the eyebrows or in the orbits. The pain is intensified by coughing or stooping the head. The brows are tender, especially at the points of emergence of the supra-orbital nerves. Photophobia is often present.

Apart from extension from the nose, other causes, such as tertiary syphilis, or the entry of fluids from forcible injections or douches may lead to inflammation in the frontal sinus.

Chronic catarrhal conditions of the frontal sinus give trouble, mainly, in proportion to the tendency which may be present towards retention of the secretions. This retention is not of frequent occurrence, owing to the dependent position of the opening of the sinus, and the close attachment of the mucous membrane to the bone round the orifice. Nevertheless, enlargement of the middle turbinate body, swelling of the mucous membrane in the infundibulum, or polypi in the middle meatus, may obstruct the orifice.

Chronic catarrh of the frontal sinus, usually present on one side only, is attended with discharge of serous or purulent fluid from the nostril. The discharge is often offensive in character, and the flow is generally intermittent. Severe pains are present in the region of the sinus and along the course of the supra-orbital nerve. It would appear that the accumulation of a very small quantity of fluid in the sinus is attended with marked pain, and intermission in the pain will be observed to coincide with the occurrence of the discharge.

Occasionally, with complete and prolonged occlusion of the outlet, the walls of the sinus become distended with the contained serous or, more usually, purulent fluid (**mucocoele** or **empyema** of the frontal sinus). Persistent and severe supra-orbital neuralgia, fever, and cerebral symptoms may be present. The walls of the sinus bulge towards the orbit or cranial cavity. The eye is pushed downwards and outwards, and its functions are disturbed. Spontaneous rupture may take place, the usual site being near the inner angle of the eye, or in the orbit.

As will be mentioned when speaking of antrum disease, supra-orbital neuralgia is often present in that affection, rendering the diagnosis from disease of the frontal sinus oftentimes difficult.

Treatment.—The symptoms of acute catarrh of the frontal sinus usually diminish and disappear with the subsidence of the nasal catarrh. Occasionally the local inflammatory symptoms, or pain, may indicate leeching or blisters over the situation of the sinus. The main indication in chronic affection of the sinus is to re-establish free communication with the nose. The treatment of coexisting chronic rhinitis, the destruction of hypertrophic tissues on the middle turbinate, and the removal of polypi may be indicated to effect this object. Hartmann recommends Politzer's air-douche to open the communication with the sinus. In some

cases a bent probe can be passed into the middle meatus and inserted into the orifice of the sinus, and thence passed up into the cavity. More frequently this procedure is prevented by the middle turbinate bone. The removal of a portion of the turbinate may render the orifice accessible. Irrigation with disinfecting lotions may be subsequently carried out through a bent canula passed into the sinus.

Other means failing, the frontal sinus may have to be opened from the front. The point usually selected is just below the eyebrow and near the bridge of the nose.

New growths occasionally develop in the frontal sinus, such as mucous polypi, cysts, and osteomata. The latter may develop to a large size and encroach on the cranial cavity and the orbit.

2. ETHMOIDAL CELLS AND SPHENOIDAL SINUS.

Acute catarrh is no doubt frequently propagated from the nose to the lining membrane of these cavities, but the symptoms are not sufficiently definite for recognition. **Chronic suppuration** may occur in these spaces, leading to discharge of pus into the nose. This disease probably arises in most cases from retention of secretion, due to more or less obstruction of the openings into the respective sinuses, in connection with nasal polypi or hypertrophic rhinitis. The anatomical situation of the sphenoidal opening, being high up in the wall of the sinus, rather favours retention and suppuration. Deep-seated pain in the frontal or orbital region, or through the whole of the corresponding side of the face, is often present. The purulent discharge from the sphenoidal sinus makes its way principally into the nasopharynx.

Occasionally the ethmoidal cells have become distended with mucus or pus. Bulging of the walls takes place in

various directions, chiefly towards the orbit, forcing the eye downwards and outwards as well as forwards. The nose on the affected side may become obstructed. Extension of disease to the cranial cavity may set up cerebral symptoms. In like manner the sphenoidal sinus may become distended, giving rise to somewhat similar symptoms. Partial or complete blindness is a symptom which has been noticed in these cases, easily explicable by the proximity of the sinus to the optic nerve.

The diagnosis of these affections is very difficult. A periodical or continuous discharge of pus from one nasal passage will, in the absence of other causes, lead to the diagnosis of suppuration in one of the accessory sinuses, but it is not easy to determine the exact source. Occasionally, in a wide nasal cavity, the orifice of the sphenoidal sinus may be visible from the front, and pus may be seen issuing thence.

Direct treatment of these cavities from the nose, with the help of the probe, trocar, or canula, has been successfully performed by Hartmann, Schäffer, Ziem and others.

New growths, such as mucous polypi, cysts, sarcomata, and osteomata, have been observed to take origin from these sinuses.

3. ANTRUM OF HIGHMORE.

Acute catarrh may spread from the nose to the antrum, though this extension appears to be less frequent than that to the frontal sinus. Pain, deep in the upper jaw, or along the infra-orbital nerve, together with pains in the teeth, especially the back teeth, may point to extension of acute catarrhal inflammation to the antrum.

Chronic inflammation of the maxillary sinus, with more or less accumulation of secretion, sometimes mucous, more often purulent, is very common. The frequency with which

chronic suppuration of the antrum occurs, and the fact that it is very often overlooked or confused with other diseases of the nose, render it desirable to describe the affection in more detail than the affections of the other sinuses.

Empyema of the Antrum.—The orifice of the antrum is situated, as already described, in the hinder part of the groove known as the infundibulum, on the outer wall of the nasal fossa, beneath the middle turbinate bone. The orifice is slit-like, and enters the cavity at a point nearer the roof than the floor, and is therefore unfavourably situated for the spontaneous escape of secretion. When, therefore, from some cause, there is any morbid secretion in the sinus, there is always more or less retention, and very apt to be decomposition of the retained fluid.

If the orifice in to the nose be completely closed, whether by swelling of the mucous membrane, by a polypus, or otherwise, characteristic signs and symptoms due to distension of the cavity, and displacement and thinning of the boundaries, will arise. The external wall may bulge, the hollow of the canine fossa may be obliterated, and even a sensation of crackling may be felt on pressure. The hard palate may be pushed down, the inner wall may bulge so as to obstruct the nasal passage, or the orbital cavity may be encroached upon. Lancinating pains in the cheek or upper teeth are usually felt, and swelling of the cheek, sometimes erysipelas, may occur.

These cases, with what we may term the old classical signs of empyema of the antrum, are very rare. Much more common are the cases of suppuration in the antrum where the opening into the nose is patent. Here the symptoms are, to a large extent, nasal, and it is this class of cases alone that will need to be considered in detail.

Causation.—Suppuration of the antrum may undoubtedly result from extension of catarrhal inflammation from the nasal mucous membrane. Diseased conditions of the middle

turbinate, and of the structures in the middle meatus, especially at the hiatus semilunaris, are often present, and are probably efficient in causing antrum suppuration, not so much by extension, as by interference with the patency of the natural opening of the sinus. Bayer* found nasal polypi present seven times, in twenty-five cases of empyema of the antrum, and Hartmann† found hypertrophies or polypi in a third of his cases. The condition present is, usually, a mass of granulations composed of polypus-like tissue, in the middle meatus, rather than true mucous polypi. It must be admitted, however, that such a condition may very well, in many cases, be the result of the abnormal discharge poured into the middle meatus from the antrum.

The larger number of cases of empyema of the antrum are undoubtedly caused by disease in connection with the roots of teeth. This is not to be wondered at, seeing that the roots of some of the teeth, viz., the canines, bicuspid, and first and second molars are separated from the antrum, ordinarily, by only a thin plate of bone. The roots of the first molars are those which approach most closely to the cavity, and sometimes these roots, and those of the second molars, pierce the bony wall, and are only covered by periosteum. Occasional causes of antrum suppuration are blows on the face, the entry of irritating fluid from the nasal douche, and necrosis of the alveolar ridge.

Symptoms.—In the class of cases here considered the pus is discharged from the maxillary sinus through the natural opening in the middle meatus, and escapes through the anterior or posterior naris. A purulent nasal discharge is therefore a necessary symptom, and is that which usually attracts the attention of the patient. This discharge is unilateral, since, except in very rare cases, only one antrum is affected. If the amount of pus escaping be large, some may occasionally enter the opposite side through the posterior

* *Deutsch. Med. Woch.*, March 7, 1889.

† *Ibid.*

naris. The pus is usually of a bright yellow colour, and almost always fetid, and both the smell and taste are perceived by the patient. The fetor is apt to be experienced in a suddenly occurring, intermittent manner, at certain moments, as the discharge enters the nose from the sinus. Although the odour is experienced by the patient, nevertheless these patients are not disagreeable to their neighbours like those suffering from syphilitic or simple ozæna. The reality of the smell, however, is abundantly evident to any one who has evacuated pus from the antrum. The odour is peculiar and characteristic, and has been compared to decomposing herrings.

The discharge is always more or less intermittent, and is often observed to appear suddenly as the patient holds his head forwards, as in writing, and it may under these circumstances trickle from the nostril. During the night the pus is apt to flow, mainly, or solely, backwards, and the patient complains of a disagreeable taste on waking in the morning. In some cases the discharge takes place exclusively backwards, and the disagreeable taste in the throat, and the presence there of purulent secretion, are the chief symptoms which indicate the affection in such cases.

In many cases there is no pain present. Other patients complain of intermittent pains in the cheek, brow, or back of the head on the affected side, or careful inquiry may elicit a history of such pains at a former period. On the whole, supra-orbital pain is that which most frequently accompanies empyema of the antrum. It is necessary to bear this in mind, as otherwise its presence might lead to the diagnosis that suppuration existed in the frontal sinus, or ethmoidal cells. The cause of this frontal pain is doubtful, but it has been attributed, and I think rightly, to occlusion of the opening of the frontal sinus by swelling of the mucous membrane in the infundibulum, and subsequent absorption of the air within the cavity. It can hardly be

due to mere radiation of pain along the branches of the fifth nerve, for frontal pain is much more frequent than infra-orbital pain. Hartmann finds that the application of the air-douche, according to Politzer's method, relieves the frontal pain.

Sometimes the pains attending empyema of the antrum assume a periodic character, appearing and gradually increasing for several days, or even weeks, while the nasal discharge has diminished or ceased, and suddenly ceasing with a re-appearance of the discharge.

On examination, the nasal cavity on the side corresponding to the disease may be found to be fairly normal, or the mucous membrane may be irritated and somewhat swollen. The middle turbinate is not unfrequently swollen, and the middle meatus may be obstructed with fungous granulation-like tissue. Sometimes true mucous polypi are present. Some creamy-looking pus may be seen on the surface of the mucous membrane. The quantity, however, is extremely variable; little or none may be visible, or a considerable extent of surface may be bathed in pus. Careful rhinoscopic examination may reveal the fact that the pus trickles from the middle meatus of the nose. It may be spread over the surface of the inferior turbinate only, or it may find its way up into the olfactory slit, and trickle down over the septum. It will usually be necessary, for diagnostic purposes, to wash or spray out the nasal cavity, and to wipe away the secretion from the middle meatus. The patient should then be directed to bend the head forwards with the healthy side inclined downwards. Then, if on inspection soon afterwards, pus appears in the middle meatus, just below the anterior part of the middle turbinate body, it may be concluded to come from the antrum. The only source of error is that in sup-puration of the frontal sinus, or ethmoidal cells, pus would make its appearance in the same position. Suppuration of these cavities is, however, comparatively rare. B. Frankel

points out a method by which suppuration in the antrum may be differentiated from suppuration in the frontal sinus. If, after cleansing the nasal cavity, the patient sits with the head forward, and the forehead down between the knees, or lies on a table on the stomach with the head hanging down over the edge, the escape of fluid from the frontal sinus is prevented. If now, after a time, pus is found in the middle meatus, the maxillary sinus must be the source.

Careful examination of the teeth will often afford collateral evidence of the nature of the malady. Decay of some tooth or teeth, mostly of a bicuspid or a first or second molar, on the affected side, may be found, and not unfrequently loosening of the tooth. Simple extraction of the suspected tooth may be followed by an immediate discharge of pus. More often the antrum must be opened with a trocar or drill through the socket of the tooth, and when this is followed by an escape of pus the diagnosis is confirmed.

McBride describes a symptom he has observed in some cases of this disease, viz., a marked redness of the gum on the side corresponding to the affected antrum.

A fine exploratory puncture of the sinus followed by aspiration has sometimes been practised with a view of confirming the diagnosis in doubtful cases. Bresgen recommends the puncture to be made in the region of the hiatus semilunaris. Schmidt recommends puncture and aspiration through the wall in the inferior meatus. Ziem speaks well of a method of exploration he has adopted, which consists in penetrating the sinus with a *very fine* drill in the interval between the two bicuspids, or between the first and second molars.

Hering has recently described a diagnostic sign, which was first suggested by Voltolini. The patient is placed in a perfectly dark room, and a small Edison lamp, of not less than five volts, mounted on a tongue-depressor, is introduced into the mouth for a few seconds. It will be found that the

bony walls of the antrum will appear red and translucent on the healthy side, while the side containing pus appears dark and opaque.

Percussion over the antrum has been recommended as a means of diagnosis, as the side containing pus may give a duller note than the healthy side.

Treatment.—As soon as the presence of antrum suppuration has been established or rendered probable, a clear indication exists for taking measures to facilitate the escape of pus, which, owing to the unfavourable situation of the natural opening, is liable to retention and decomposition. The first step is to have the teeth examined by a dentist, who will remove one or other of the first or second molars, or of the bicuspid, which may be decayed or loosened. This proceeding may give exit to a flow of pus, in which case all that will be necessary is to further enlarge the opening. If extraction of the tooth has not opened the sinus, the cavity is easily reached through the socket with a trocar or drill. Where no diseased tooth is present, and no gap exists in the site of a former tooth, many recommend the extraction of a first or second molar, but some of the alternative plans of treatment to be presently mentioned should, in such a case, be previously considered. In an edentulous jaw the antrum may be reached by perforation of the bone in the line of the alveolar ridge with a dentist's drill.

Having once obtained the counter-opening in the alveolar ridge, free irrigation and drainage of the cavity is now possible. The fluid injected through the opening flows from the nose, bringing away a greater or less quantity of offensive and inspissated pus. A cast is now taken of the part by a dentist, and a plate with a tube fixed in it, corresponding to the opening in the antrum, is fitted and secured in the ordinary way. The lower opening of this tube is kept plugged, and the plug is removed when the cavity has to be syringed. This syringing should be done

two or three times daily, and afterwards at longer intervals with a warm disinfecting lotion, such as a solution of permanganate of potash or boric acid. As soon as we find that pus ceases to come away with the fluid, we may omit the syringing for a few days, and then, if the cavity is still free from pus, we may allow the opening to close.

Other methods of irrigating the sinus may be adopted, when for any reason perforation of the antrum through the alveolar ridge seems contra-indicated. Objections have, indeed, been raised to opening the sinus through the alveolar ridge, on the ground that particles of food and pathogenic micro-organisms from the mouth are apt thereby to enter the sinus. These objections are probably chimerical, and in any case they may be guarded against. The unwillingness to sacrifice a tooth, especially if the teeth are all quite sound, is, however, the most cogent reason for adopting some alternative method.

The alternative methods at our disposal are, washing out the sinus through the natural opening in the middle meatus; perforating the cavity through the wall of the nose in the inferior meatus; and, finally, making the opening in the canine fossa. Hartmann, Störk, and others, prefer to wash out the sinus through a bent canula passed through the natural opening, or through an opening which can be easily made through the naturally thin nasal wall just below and behind the hiatus semilunaris, and just above the attachment of the inferior turbinate bone. This method is, however, not unfrequently very difficult and sometimes impossible. Hartmann, indeed, recommends, if necessary, the removal of the fore part of the middle turbinate body, to facilitate the procedure.

Mikulicz, B. Fränkel, and Krause advocate a counter-opening, made with a bent trocar, in the outer wall of the nasal fossa, below the inferior turbinate, about midway from before back. This operation is sometimes very difficult if the in-

ferior meatus is contracted, and it may be attended with pretty sharp hæmorrhage.

The counter-opening in the canine fossa is easily performed, and is recommended by Christopher Heath and others as the most satisfactory alternative to perforating the alveolar ridge. This opening is favourably situated for subsequent irrigation of the cavity by the patient himself.

In all cases suppuration of the antrum is apt to prove a very tedious affair. Although in a few cases, especially in those of recent origin, a rapid cure may be effected, we must, as a rule, be prepared for many months of treatment before the discharge ceases, and the opening can be allowed to close. It is useful in chronic cases to follow the cleansing with some stimulating injection, such as a solution of nitrate of silver or chloride of zinc. Recently Friedländer has described good results from giving the cavity one thorough wash out, to begin with, and then dusting the interior freely with iodoform or iodol. Schech has obtained a cure in very obstinate cases that resisted all other treatment by drilling a large hole in the canine fossa, and plugging the cavity with iodoform gauze.

In spite of all our efforts pus formation may continue for an indefinite period, extending, it may be, over years. In such cases a profound alteration of the mucous membrane may be supposed to exist, requiring more vigorous measures. Enlarging the counter-opening and scraping the interior with a curette has sometimes led to good results. Moreover, a tooth or other foreign body has occasionally been found lodged in the antrum. Through an enlarged opening we can detect and remove such a body, or a fragment of necrosed bone if present.

It is possible that an anatomical peculiarity, such as the subdivision of the cavity by projecting bony laminæ, may sometimes interfere with the free drainage, and thus be the cause of the indefinite prolongation of the discharge.

Morbid conditions of the nose should always be attended to. Hypertrophied tissue, fungous granulations, or polypi, may be present, which, if not the actual cause of the disease, will in any case require treatment in order to secure the free patency of the natural orifice.

New Growths in the Antrum.—The antrum is not unfrequently the seat of new growths. Mucous polypi sometimes occur, and they occasionally protrude thence into the nasal fossa through a dilated ostium maxillare. Cysts sometimes spring from the mucous lining of the antrum. A cyst may reach such a size as to fill the whole cavity, and may even cause expansion and thinning of the walls of the cavity. The cheek becomes rounded and prominent, and parchment-like crackling of the thin bone may be experienced on pressure. This is the condition formerly described as *hydrops antri*. Fibromata, osteomata, sarcomata, and epitheliomata may originate in the antrum. By gradual thinning and breaking down of the bony walls the neighbouring cavities may be invaded, and excessive displacement and deformity may result.

XXXI.

FORMULÆ.

THE following formulæ are examples of those which are found useful in the local treatment of diseases of the nose and naso-pharynx. Most of them may be altered in strength and composition to suit particular cases, and other combinations of a similar character will suggest themselves. The rules and principles which guide their application are contained in various sections of the work.

1.

R. Sodii Bicarb. gr. iv
Boracis gr. iv
Aquæ ʒi

An alkaline cleansing lotion for use, with the spray-producer, douche, or syringe, in chronic rhinitis, chronic naso-pharyngeal catarrh, etc.

2.

R. Sodii Bicarb.
Boracis
Sodii Chlorid. āā gr. vii
Sacch. Alb. gr. xv

This powder, dissolved in about half a tumbler of tepid water, forms the "compound alkaline wash" referred to in the work. (Morell Mackenzie's formula.) Used with the spray-producer, douche, or syringe, in chronic nasal and post-nasal catarrh, atrophic rhinitis, etc.

3.

R. Sodii Bicarb.

Boracis āā gr. vi

Glycerini Acidi Carbol. ℥ xii

Aquæ ℥i

“Dobell's Solution.” An alkaline disinfecting lotion, useful in chronic rhinitis, atrophic rhinitis, etc.

4.

R. Liq. Potass. Permang. ℥ v

Boracis gr. v

Aquæ ℥i

Like the preceding.

5.

R. Boracis

Sodii Benzoatis āā gr. v

Thymol gr. $\frac{1}{2}$

Aquæ ℥i

Like the preceding.

6.

R. Acidi Tannici gr. v-xx

Aquæ ℥i

Astringent lotion, for use, with the spray-producer, in chronic rhinitis, and naso-pharyngeal catarrh. Similar formulæ are: Aluminis gr. ii-iv, Aquæ ℥i; Zinci Sulphatis gr. ii-iv, Aquæ ℥i; Zinci Chloridi gr. i-ii, Aquæ ℥i; Zinci Sulphocarbolat. gr. ii-iv, Aquæ ℥i.

7.

R. Morph. Hydrochlorat. gr. ii

Pulv. Acaciæ ℥ii

Bismuthi Subnit. ad ℥i

“Ferrier's Snuff.” Used as a snuff, or insufflation, in acute rhinitis.

8.¹

R. Cocain. Hydrochlorat. gr. ii
Magnesiæ Pond. ʒi

Used as a snuff, or insufflation, in acute rhinitis.

9.

R. Cocain. Hydrochlorat. gr. ii ss.
Morphiæ Hydrochlorat. gr. $\frac{1}{4}$
Pulv. Camphoræ gr. v
Bismuthi Subnit. ʒii

Recommended by Moure in acute rhinitis, as a snuff or insufflation.

10.

R. Bismuthi. Carb. ʒii
Pulv. Acidi Borici ʒi
Pulv. Acaciæ ʒi

For insufflation in chronic rhinitis, etc.

11.

R. Pulv. Acidi Tannici x
Pulv. Acaciæ ʒi

Astringent insufflation, for chronic rhinitis.

12.

R. Acidi Tannici gr. x
Pulv. Camphoræ ʒi
Pulv. Amyli ad ʒi

Insufflation, useful in chronic rhinitis, and post-nasal catarrh.

13.

R. Acidi Salicylici gr. xl
Magnesiæ Pond. ʒi

Stimulating insufflation, useful in atrophic rhinitis, and some forms of chronic rhinitis.

14.

R. Pulv. Eucalypti Gummi 3i
 Pulv. Amyli 3ii

Insufflation, useful in chronic rhinitis, atrophic rhinitis, etc.

15.

R. Hydrarg. Subchlor. gr. xl
 Bismuthi Subnit. 3ii
 Magnesiae Pond. ad 3i

Stimulating insufflation, useful in chronic nasal and post-nasal catarrh, etc.

16.

R. Pulv. Sanguinariae vel Pulv. Galangæ 3ii
 Pulv. Amyli ad 3i

Recommended by Bosworth as a stimulant in atrophic rhinitis.

17.

R. Pulv. Iodoformi 3i
 Pulv. Amyli 3i

A disinfecting and deodorizing insufflation, useful in atrophic rhinitis, syphilitic ozæna, etc. Iodol may be substituted for Iodoform, and it has the advantage of being free from odour. Either may be insufflated pure without the admixture of starch.

18.

R. Acidi Carbol. ʒ ss.
 Liq. Ammon. Fort. ʒ ss.
 Spir. Rectificat. ʒi ss.
 Aquæ Destillat. ad ʒiii ss.

Hager and Brand's "Anticatarrrhal Remedy," referred to in the section on acute rhinitis.

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